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## CONTENTS.

An Asterisk (*) denotes an illustrated article.


EDITORIALS—

The Reports on State Gas Commissions ... 1

Gas as a Source of Light, Heat and Power ... 2

The Meeting of the British Gas Institute ... 2

Gone Over to the Majority ... 2

Ninth Annual Meeting of the Western Gas Association—Official Report—Continued from Vol. XLIV., page 352 ... 3

Leakage, by E. H. Jenkins—Discussion—Second Day, Morning Session, Thursday, May 13—Election of Mr. A. C. Wood to Honorary Membership—Response of Mr. Wood—Memorial Resolutions—Election of Officers—Next Place of Meeting—Report of Committee on President's Address—Printing the By-Laws—Reports of Standing Committee on Gas Commissions—Majority Report—Minority Report.

Second Annual Meeting of the Ohio Gas Light Association—Official Report—Concluded from Vol. XLIV., page 354 ... 9

Natural Gas as a Competitor of Coal Gas for Illuminating, by E. B. Philipp—Discussion—Election of Jos. R. Thomas to Honorary Membership—Election of Officers—Votes of Thanks.

Special English Correspondence ... 11

Modern Gas Purification—Gas and Petroleum from an Industrial Point of View—The Midland "Gaseries"—The Gas Institute Meetings.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES ... 12

Annual Election, Quincy (Ills.) Gas Light and Coke Company—The Easton (Pa.) Municipality Invests in an Electric Lighting Plant—Cheaper Gas for Little Rock, Ark.—Electricity to Light the Streets of Rahway, N. J.—The Candle Power of the Denver (Col.) Electric Street Lights—Fired by Electric Wires—Cheaper Gas for Jefferson City, La.—A Line or Two from Atlanta, Ga.—Brother Denniston Once More Declares His Intentions—Messrs. Davis & Farnum on the Forward March—Messrs. Connelly & Co. Still "Unlimited"—The Works of the New Citizens Company, at Rye, N. Y.—New Holder for the Salem (N. J.) Gas Light Company—An Odd Street Lighting Contract—A Word from Memphis, Tenn.

Notes from the West, by Retort ... 14

Magnesia in Portland Cement ... 14

Thermometers for White Heat ... 14

The Market for Gas Securities ... 15


## THE REPORTS ON STATE GAS COMMISSIONS.

The way in which the special committee—appointed over a twelvemonth ago by the Western Gas Association to consider the advisability of taking decided steps in the matter of the formation of State Gas Commissions—investigated the subject entrusted to their care speaks for itself; and not only does it speak loudly, even if not altogether harmoniously, therefore not the less honestly, but it possesses one other feature, most pertinent and valuable, about which we cannot forbear to make passing mention. The Gas Managers' Associations of this country have been unfavorably commented upon, if we might not say sneered at, more particularly by our brethren of foreign lands, because of the fact that the members thereof are disposed to remit so many important matters to the consideration of special committees. The plan of remission to committees is based upon the soundest principles which underlie *satisfactory* and speedy transaction of the business of large assemblies. Given, that the appointing power is impartial and discriminative, but one result can accrue; and that result, briefly stated, is the precise accomplishment of the end sought for. Even if the appointing power be prejudiced or poorly applied, the acumen of those by whom the findings are to be discussed may be trusted to discover the inequalities or bias of their representative investigators. But one difficulty stands in the way of the never-failing success of this style of assembly work; and that difficulty springs from the dilatoriness or neglect of the committeemen. It is the only cause for fear that flies may be found in such ointments. Taking leave of that portion of the question, by giving voice to the hope that the committee system will rather increase than diminish, we may address ourselves to the subject proper with the statement that Messrs. Ramsdell, Cosgrove and Prichitt deserve the warmest thanks of every American *gas financier* for the labor of love undertaken at the behest of the *gas engineers* who nominally figure as the paid servants of the gas investors. Of course, it is unnecessary for us to here readvocate that for which for years we have earnestly contended for in these columns. Callender, Wurtz, and Dresser—names sufficiently well known and closely and honorably identified in their exposition of the true principles of gas industry—stood up in the past for what we now earnestly urge in the present. Nor do we forget that their task was much more difficult than ours. High selling prices, fat dividends, and almost superb (were it not inane) indifference to the demands of the consumers acted against our predecessors' initial attempts at tutorage—of course, we suppose it to be understood that these strictures apply to the *gas financiers*, and not to the gas makers. For certainly, at least 90 per centum of the older engineers are well aware of the counsel which they gave to their boards of directors in those respects years and years ago. Remembering these things, if for no other reason, we are with the signers of the majority report of the Committee on Gas Commissions of the Western Association; and live in the fullest expectation that great things will spring from their action. The tribute paid to the Massachusetts measure is not only fraternal but just; for the Bay State men had the courage to act while their confreres looked on. We note one sentence in the report, "It (the Massachusetts measure) is full of valuable features, but impresses one more with the idea of its future perfection than its present value," and from which we wish to partially dissent. Its present provisions have been found strong enough to batter the spirit out of one opposition scheme that would have shown its ugly head last month. The parties who contemplated the "stroke of business" sifted the ground over pretty thoroughly, and finally concluded that the Massachusetts Gas Commission law was strong enough to keep them out. We doubt very much whether the local gas suppliers of the place intended to be attacked had any idea that the "philanthropists" were honoring them with a "business scrutiny," and the "scrutineers" will probably wonder how it comes about that "Pennsylvania cannot attempt anything without its being known in New York." However, if the committee concedes that the Bay State act is replete with valuable features, no one can reasonably ask for a more favorable verdict. The Statute Books were not made in a day, but the process of legal evolution is reasonably rapid when the ethics of the Code are found to be soundly based.

The minority report of Mr. Prichitt is really but a modification of some of the opinions put forward by the majority of the committee. Winnowed down to the grain, his only real objection is the fear that corrupt or incompetent men may be selected; but at the same time he rends his argument to tatters by giving the lines on which that fear may be dissipated. If the sturdy and upright controller of the fortunes of the Nashville (Tenn.) Gas Light Company had framed his words only with reference to vesting the appointing power in the hands of Mayors or Boards of Council, our enunciations would be but the echo of his own. But as it is proposed to vest that power in the Chief Executives of the different States, we will not coincide with him as to the likelihood that such power will be abused. American politics is a queer and dangerous art; but those who aspire to and secure high rank therein are not apt to wilfully abuse that power. Long tenure of office, and proper remuneration, as the incentives to straight work in a gas commissioner's chair, will attract the right sort of men to the office, and reduce the danger line to the minimum. Look the world over, and where else as a rule will you find grander examples of probity and honor than those who occupy the higher judicial positions in the gift of the people of the several States. Surely, if our system of universal suffrage can secure the selection of such servants, cannot the gas men believe that the Governors—the latter the creatures of the public—of our States may be trusted to select proper men for the position of Gas Commissioners, whose duties will not be a whit short of the dispensation of justice, and which will also include the moral control of a business inseparably connected with the "public morals, health, and safety."

## GAS AS A SOURCE OF LIGHT, HEAT, AND POWER.

The intelligent observer of the history of artificial illumination during the past few years must be very willing to admit that the electric light companies have had one great advantage over the gas companies, insomuch as the former have been able to keep control of the distribution of their light up to the —we were going to say point of combustion—let us rather say up to the point from which the light is emitted; whereas the gas companies have been forced to relinquish their supervision of the commodity they supplied at the meter. The disadvantage under which gas has labored in this particular is a matter of no small consideration; for while a great deal of ingenuity has been displayed of recent years in perfecting the different styles of gas burners, as well as in developing the various styles of electric lamps, the electrician has been able to—we might almost say—force the consumer to adopt the improved lamps, the gas manager has been compelled to view, with such complacency as he could command, a gas, capable of giving a light of 19 candles, being burned in such a manner as to give an illumination of only 9 or 10 candles. True, most gas companies have made an effort to correct this evil by having on exhibition in their offices samples of poor and of good burners; but it is only a small proportion of the customers who will take the time to examine them. What we have needed is some way to bring home to the gas user the fact that he cannot afford to misuse gas.

Again, most gas companies have endeavored to familiarize their customers with the advantages to be derived from the use of gas for other purposes than illumination; and, with that object in view, have distributed circulars, of greater or less pretensions, setting forth the utility of the gas engine and the gas stove. However, a single company could hardly afford the expense of publishing a pamphlet of more than a few pages. Other gas companies have sent to their customers copies of a paper, read by Mr. W. W. Goodwin at the Philadelphia (Oct., 1879) meeting of the American Gas Light Association, giving the results of some experiments made by the author in cooking meats and other viands by gas. Doubtless the distribution of these figures has done much toward advancing the cause of the gas stove; but still something more was needed, for it is not everyone who will take the trouble to examine a table of such a nature. These considerations lead up to the thought that the workers in the field of gas industry have stood in need of a small pamphlet, which they could obtain at such a figure as would allow of their being distributed freely among the customers and others, dealing in a succinct yet readable manner with the use of gas as a source of light, heat, and power.

We are glad to be able to say that an attempt has been made, by Mr. C. J. R. Humphreys, of Lawrence, Mass., to fill this void. Whether the essay will be deemed a success or not will depend greatly on the standard by which the critic would attempt to judge the work. If it is thought that such a pamphlet should be a large and cumbersome affair, dealing in a learned and scientific manner with the theory of combustion, and trying to show the defects and strong points of every burner which has ever been invented, as well as to give a history of the various uses to which gas has been put, illustrating every stove and engine which has ever been devised—if, we say, this is the standard which the critic thinks the book should attain unto, then we think Mr. Humphreys' work would be found wanting. But in our judgment the gas industry does not stand in need of a heavy, cumbersome work of that kind; for how many gas consumers are there who would follow the author through page after page of theorizing on so abstruse a subject? We fear the answer, if expressed in the percentage of the total number of gas consumers, would be a very small figure. The object which, in our judgment, should be aimed at in writing a handbook of this nature is to present in a brief yet readable form some of the chief points in connection with the use of gas as a source of light, heat, and power; and to do it in such a way as to beget in the reader a spirit of inquiry, rather than to attempt to give him a surfeit of information on the points considered. Judged by such a standard, we think the work under review is eminently successful. In the opening chapter it shows the consumer, at the very start, that the subject under discussion is one he cannot afford to pass without giving it careful consideration; then the different forms of burners are illustrated, and the chapter is closed with a brief account of the high power burners.

The chapter on gas cooking stoves opens in much the same way, and demonstrates, at the beginning and in very readable style, that gas for cooking is an innovation no one can allow to pass without giving it close attention; then, after giving illustrations of the various styles of cooking stoves, the use of gas for heating and motive purposes is considered. The pamphlet gives, in a small compass, a great deal of information on the topics treated of, and in such a way as to get the reader interested in the subject, thus leading him, if the brochure accomplishes its purpose, to go to the nearest gas office and inquire into the subject more fully.

We believe, earnestly, that a gas company which is desirous of holding its own in this age of competition could not invest money to better advantage than by buying a liberal supply of these pamphlets, and distributing them freely, not only among its actual customers, but also among those which it would like to have as customers. If a gas company wishes to hold its own against other illuminators it must show its customers how to properly burn gas. If gas companies would push the use of gas for other purposes than illumination, they must bring the matter to the attention of their people. This little pamphlet gives them the means to accomplish these ends.

If a gas manager were to distribute a thousand of these tracts among his customers he would surely get back, a dozen times over, the cost of the investment every year. And if he were to distribute a thousand of them among would-be customers his application book would surely bear, promptly, evidence of the wisdom of his actions.

Gas companies ordering these pamphlets can have their own imprint put on the cover without extra charge. Companies should not fail to send in their orders speedily; and while prompt attention will be given to every demand made, orders will be filled in accordance with their reception. In plain words, "First come, first served."

## THE MEETING OF THE BRITISH GAS INSTITUTE.

The Twenty-third Annual General Meeting of the Gas Institute was held in London on the 8th, 9th, 10th, and 11th days of June last, the sessions being carried on in the lecture hall of the Institution of Civil Engineers, Westminster. The papers presented and read were limited to eight; but, as usual, they were of a high order of merit. President Lane's address was a feature of the gathering; and our special English correspondent's views (see page 12) thereon may be accepted as accurate. The Birmingham medal was awarded to Mr. Charles Hunt, of Birmingham. It is needless to add that the honor was deserved. Seventeen applicants for membership were elected. Friday (the closing day) was devoted to an excursion to the experimental farm of the Royal Agricultural Society, at Woburn, and the manufacturers of sulphate of ammonia in gas works were there treated to a view of how it is practically applied as an enricher of the soil. The only unpleasant circumstance in connection with the meeting was the absurd attitude assumed by Mr. Geo. Bray, of Leeds, who duplicated, if he did not even surpass, his antics of a year ago. We opine that were Mr. Bray dealing with our American Association his name would not long figure on its membership list. We hope in due season to republish some of the papers that were read.

## GONE OVER TO THE MAJORITY.

The many friends of Mr. John Anderson, late President of the Standard Gas Retort and Fire Brick Company, Ironton, Ohio, will be shocked over hearing that his death occurred on the afternoon of Friday, June 25. The remains were interred in Greenwood Cemetery, Brooklyn, N. Y., in which city the only relations of the deceased in this country reside. Mr. Anderson was perhaps 60 years of age, and by birth an Englishman. He was an active member of the Ohio and Western Gas Associations. Beyond these mere details we are at present unable to go.

A telegraphic despatch from Phila., Pa., dated June 26, conveyed the information that Mr. Peter Munzinger, who, as constructing engineer of the old firm of Messrs. Morris, Tasker & Co., was known by all the gas world, died from lockjaw on June 25. Some three weeks ago he had sustained a fracture of the thigh. We hope to publish some account, in a future number, of his life's work.

[Official Report—Continued from Vol. XLIV., page 352.]

## Ninth Annual Meeting of the Western Gas Association.

Held at the Neil House, Columbus, Ohio, May 12 and 13, 1886.

First Day—Afternoon Session.

Mr. E. H. Jenkins, of Columbus, Ga., read the following paper on—

### LEAKAGE.

In presenting this paper to the members of the Association I am aware that it contains nothing of a very startling nature; and, perhaps, no new ideas will be advanced in it. In fact, upon looking it over, I am somewhat chagrined at the meagerness of the information contained in it; but, having promised our worthy Secretary that I would present a paper, in redemption of the promise let me read the following.

The subject of leakage is one about which we all have more or less interest—most of us more; a few, less. Especially are we of the smaller towns frequently exercised over the discrepancy between the amount of gas made and that which our cash books show returns for; and although our plants are on the small scale, we generally possess a much greater showing of main pipes to annual output than is the case with our brethren in the big establishments. Indeed, as a rule with those of the former class, the quantity of gas sent out per mile of main is very small.

That and other items, such as smaller mains, and consequently of a class more liable to fracture, small service pipes, etc., cause the managers of small works to watch very closely over their leakage accounts.

Upon assuming charge of the Columbus (Ga.) Gas Works, two years ago, I immediately took a retrospective glance over the results of the operations of the company for the two or three years prior to my time of entering the company's service. Upon carefully looking over the books I found the company's make of gas had been 9,000,000 cubic feet in the previous year; had sold and used 6,543,000 cubic feet in the same time; and, consequently, had lost 2,457,000 cubic feet (or 27.3 per cent.) of all the gas made. I was astonished, which astonishment was also shared in by my board of directors when these figures were brought out. It is needless to say that, of course, I was readily granted the privilege of instituting measures to remedy the evil.

An examination of the pressure gauges, etc., proved the fact, while the works could boast of a good pressure governor (when properly adjusted), that it was rather oddly handled. While the men in charge regularly put on and took off pressure, at proper times as they supposed, yet the operation was a mere form, because the valve of the governor was *not in position*, and the full pressure of the holders was on the street mains at all hours of the day, except for the partial control resulting from the eccentric regulation of a holder valve.

This state of affairs was at once corrected, with the natural sequence of an immediate and important decrease in the leakage account. I next bye-passed the outlet valve with a one-inch pipe, placed a 20-light meter on the bye-pass, and on several Sunday mornings I shut down the valve and compelled all gas going to the streets to pass through the meter. By watching this closely and keeping a record of each hour, I soon found out just what amount of lost gas was due to leakage—we had a very small Sabbath day consumption, and I was speedily convinced that our loss was due almost entirely to leakage, pure and simple, and was not traceable to slow meters, etc. Having had considerable leakage trouble in one or two other works with which I had been connected, and which was traced to the small mains in the outer sections of the districts, I commenced, in Columbus, on the same lines of search.

Where it was possible to do so I bye-passed each small line of pipe, and placed a meter thereon. At that hour of the day when in reality no gas was being used I kept close watch of the meter dial in the attempt to determine the leakage on each particular line examined. I met with poor success, since, with only two exceptions, I found these lines to be in comparatively good condition. I then resolved upon examining the down-town territory. A friend of mine (a gentleman connected with one of the large factories of our town, and who had watched with some interest my efforts to get at the seat of leakage trouble) informed me that every time he passed a certain corner of the main street he "smelled something like rotten eggs;" and he thought "it *might be* that gas was leaking there."

Next day I had a force of men digging down after that "smell," and I found, at the particular point noted, nothing but a "smell." Its strength induced me to strip the main for a certain length each way. Having uncovered about 50 feet I struck what was once a service pipe; but which had become the most "unserviceable" service pipe imaginable. In fact, an attempt to remove any portion of it reduced the disturbed section to a fragmentary state, so badly was it eaten out.

I took up each service on that particular block, and found all of them more or less eaten through from the tapping point in main pipe to the sidewalk. Under the sidewalk, however, the pipes were in good condition.

As the services were seemingly bedded in soil which was of the same nature in both sidewalk and roadway I was curious to find out why they (the services) should be in worse condition in one situation than in the other. The soil consisted of a sandy, clayey mixture with not enough sand in its composition to charge it with undue porosity, and I concluded that some other cause must exist for the rotten condition of the pipes than that afforded by the nature of their earthen covering.

I had taken up about a dozen services when I approached one that had been only a comparatively short time in duty. This I expected to find in fair condition; but imagine my surprise when on digging it out I found it badly eaten with rust.

The building which this pipe supplied is at the present time occupied as a drygoods store; but, upon inquiry, I found that the premises had been formerly occupied by a retail dealer in groceries. I further found that these grocerymen handled each year large quantities of salt meat. This salt meat (sometimes more like salt than meat) was hauled to the store and thrown on the sidewalk. During that process, of course, a good deal of the salt fell from the meat on to the walk. Again, when the meat was sold it was brought out over the same route once more; and in the second handling new quantities of salt were deposited. The grocer's brooms in time swept the salt into the roadway, and the rainstorms washed the saline deposits into the subsoil, each additional dose sinking deeper underneath, and washing further along the roadbed, until finally the ground became thoroughly saturated with the evil. Here was where I found the greatest trouble—the salty soil had almost eaten the pipe completely up.

In relaying the services I coated them heavily with coal tar; and hope by such means to make them last somewhat longer; but I have decided that pipes laid in such soil should be renewed at least once in ten years. In fact, I may find that they will need to be replaced in even a shorter period. I found several one-half-inch service pipes that led to lamp posts; and in some instances small stores were fed from pipe of similar diameter.

In nearly every instance I found these small pipes completely used up; and I submit that in no case should a service pipe of less than three-quarters of an inch in diameter be laid. Indeed, I would prefer to use even larger than this—the larger pipes, being thicker, stand longer.

Of course, I found a number of defective main joints; but the chief source of the leakage was traced to the defective services. We have taken out over 200 so far, and I expect to renew the balance this summer.

The net result has thus far been a reduction in leakage, from 2,457,000 cubic feet in 1883, to 1,390,000 cubic feet in 1885; or a saving of 1,067,000 cubic feet per annum. A saving like this will go a great way toward paying the salary of a superintendent.

In this connection I think one of the most important things to be done in order to keep up with this leakage question is to require the superintendent to furnish monthly reports thereon. I do not mean a mere estimate, either; but rather incline to the view that the presentation should be in the shape of a carefully prepared report. I am speaking more especially of the smaller works, or in those where the superintendent possibly thinks that these details are not necessary; but in keeping up to each month with his report, he is in position to quickly notice any increase in the amount of leakage returned, and thus may immediately institute inquiry as to the cause of the change. On the other hand, if he allows a greater period to elapse—I have known instances where 4 and even 6 months have been allowed to intervene between such statements—his knowledge will be acquired at the cost of an important loss to his employers.

*Discussion.*

The President—I have heard it said that, to some gas companies, hunting after and repairing gas leakages was like discovering veins of gold. I think Mr. Jenkins has found it so. This is a most important subject, and I hope it will be thoroughly discussed.

Mr. Odiorne—What size is your smallest main?

Mr. Jenkins—Our smallest cast iron main is two inches in diameter.

Mr. Odiorne—You do not recommend the employment of a smaller service than three-quarters of an inch. How would you make a joint larger than three-quarter-inch on a two-inch main?

Mr. Jenkins—As to the first, no; as to the other, I would use a sleeve,

Mr. Lansden—What proportion of your unaccounted-for gas do you charge to leakage, and what to condensation?

Mr. Jenkins—Last year I do not believe ten gallons of drip were taken from our mains. I think it is all leakage.

Mr. Odiorne—Did you charge any of it to shrinkage?

Mr. Jenkins—We properly condense and purify our gas before it goes to the station meter, and the gas is kept at nearly even temperature between the station and consumer's meters. I do not attach any importance to loss from shrinkage in our locality. Our gas passes out from the station meter at, say, 60°, and is measured in the consumers' meters at about 58°.

Mr. Odiorne—As a rule, are your consumers' meters above or below stairs?

Mr. Jenkins—Generally upstairs. You must remember that the temperature at Columbus, Ga., is very unlike that which prevails at Columbus, Ohio.

Mr. Cornell—The subject of leakage is exceedingly important, and has great interest for all of us. My attention was especially called to it last year, or at the period when they were discussing the possibility of transporting natural gas to Youngstown, Ohio, from wells located at a considerable distance from that city. Natural gas is oftentimes conveyed at a very high pressure, and some now claim that wrought iron pipes must be the description in which to convey it. In view of the discovered necessities of natural gas distribution, great care is being taken in the method of placing the mains. It seems to me that artificial gas suppliers should observe the same, if not greater, care over their distribution plant; and it should be our duty to know that our conduits are sound and tight. Scant sizes of services are great sources of loss.

Mr. Scofield—Four years ago, when I secured control of the Fort Scott (Kan.) plant, the service pipes, and more especially those leading to the lamp posts, were in wretched condition. The latter would average three-eighths of an inch in diameter, and in many cases they were completely eaten up. Some of them would barely hold together on the under side, and, in fact, the gas was only passing through a channel in the clay. Our soil appears to have been the result of the disintegration of a top sandstone which formerly rested on a limestone bed. It is now a washy sort of reddish, sandy clay; and I am satisfied that a three-eighth-inch service resting in it would be partially destroyed within ten years. We now use one-inch services, and our leakage account has been largely reduced. I had trouble last year on a line of new main which had been heavily coated with tar before it was placed in the earth. We were obliged finally to strip the line and repack every joint on it.

Mr. Smith—Were the pipes coated outside and inside?

Mr. Scofield—Yes, sir. Now we buy uncoated pipe and prepare it ourselves. We are then sure that the spigot ends will be perfectly clean.

Prof. Douglas—One prolific source of leakage is traceable not so much to service pipes as to the age of the street mains. The constant expansion from season to season loosens the lead joints. The sliding joint is constantly expanding during the summer and contracting during the winter, moving with every change of the season, and almost with every change of the weather; and thus, after a few years, we have a leaky joint. I am quite sure, at our Ann Arbor (Mich.) works, where we have pipe which has been buried over 20 years, that much the larger proportion of our leakage arises from that fact.

Mr. Howard—At what depth are they buried?

Prof. Douglas—Not over 18 inches. Undoubtedly, that is one source of trouble.

Mr. Scofield—That would not affect them greatly in Mr. Jenkins' Georgia location.

Mr. Murdock—Does Mr. Jenkins find any difference in loss as between winter and summer?

Mr. Jenkins—The percentage will vary, of course, as between summer and winter; but it is very slight with us—hardly worth noticing. I think that the plan of monthly leakage reports is most important. I adhere to the method with great strictness.

Mr. Lansden—How do you calculate the street lamp consumption?

Mr. Jenkins—I figure my street lamp consumption at the same rate for each hour of each month, and keep a correct record of the number of hours of burning.

Mr. Odiorne—Do you not think that some difference is caused by the state of the burners? For instance, after a four-foot burner has been in use for some months it may become clogged to the extent that it will not pass more than three feet.

Mr. Jenkins—Our burners do not clog up in that way. If your gas is pure I do not think you will have that experience.

Mr. Dunbar—When your leakage was the greatest was your sendout equal to that of the year before? Also, what was your consumption as compared with the year before?

Mr. Jenkins—In the last three years the sendout has varied but a few hundred thousand either way. Some years ago we charged three dollars per thousand for our gas, but at the present time we are selling at $2.25; and the chief reason for the lower rate is because we have so largely reduced our leakage account. We do not make any more gas now than we did then, but sell over a million feet more. I compared some months of this year with the same months of 1884, and found that while we were selling more gas now than was the case then, we were actually making a smaller quantity.

Mr. Odiorne—At Springfield (Ills.) we formerly carried a pressure of 3 inches, and leakage absorbed 30 per cent. of our make. Although a leaky holder was accountable for a portion of that tremendous shrinkage, I think the heavy pressure should be charged with the lion's share of the loss. The holder has been repaired, and the initial pressure has been cut to 12-tenths; and our leakage account has been diminished by 50 per cent. High pressure is, in my opinion, the most dangerous factor in this thing.

Mr. Jenkins—During the two last years we have carried one inch day pressure; and our heaviest night pressure has not exceeded two inches.

Mr. Ramsdell—Do you use check burners?

Mr. Jenkins—Yes, sir.

The discussion was carried on at some further length, by Messrs. Morgans, Jenkins, Lansden, Ramsdell, and others, but in quite similar line to that above reported. At its conclusion, on motion of Mr. Ramsdell, a vote of thanks was tendered to Mr. Jenkins.

The Association hereupon adjourned, to reassemble at 10 A.M. of the following day.

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SECOND DAY—MORNING SESSION—THURSDAY, MAY 13.

The Chairman, at the hour appointed, called the assembly to order.

ELECTION OF MR. A. C. WOOD TO HONORARY MEMBERSHIP.

Mr. J. B. Howard, of Dubuque, Iowa, addressing the Chair, said: Mr. President, we have with us this morning a distinguished gentleman, in the person of Mr. Austin C. Wood, Manager of the Syracuse (N. Y.) Gas Light Company, and President-elect of the American Gas Light Association. It is with great pleasure that I move his election to honorary membership in this Association. The motion received a dozen seconds; was immediately placed before the assemblage, and carried with hearty unanimity. The President, in officially notifying Mr. Wood of the result of the ballot, spoke of the genuine pleasure he experienced in announcing the action just taken by the Association; and felt that in thus honoring Mr. Wood they also honored themselves.

RESPONSE OF MR. WOOD.

Mr. Wood thus spoke in reply:

This is indeed an unexpected honor, but one which is fully appreciated. I think you all understand my position with regard to these Associations, and the value I set upon their influence. In our Eastern end of the country, and I presume a similar statement applies to you here in the West, there are but few indiuidvals whose education as gas men is completed and finished. Such men do not join these associations. Having all the information necessary for their own supposed guidance, they propose to keep it to themselves, and have no desire to impart it to others I am quite of the opposite opinion and practice. I have had thirty years' experience in our business, and find that I learn something new at every meeting of this and kindred associations which it has been my good fortune to attend. I thank you, gentlemen, for having elected me as an honorary member of this Association. (Applause.)

MEMORIAL RESOLUTIONS.

Mr. Howard, Chairman of Committee appointed to present resolutions relative to deceased members, presented the following:

*Whereas*, The members of the Western Gas Association have learned with profound sorrow and regret of the death of our esteemed and honored late associates, Messrs. Alfred Odiorne, P. E Scobey, and J. M. McLean; therefore, be it

*Resolved*, That we shall ever mourn the loss of these, our esteemed associates.

*Resolved*, That we tender to their families our sincere and heartfelt sympathies in this, their, and our, great bereavement.

*Resolved*, That these resolutions be spread upon the records of this Association; and that a copy of the same be transmitted to the families of our deceased friends.

J. B. HOWARD,
C. M. KELLER,
G. A. HYDE, SR., } Committee.

On motion, the report and resolutions were adopted.

ELECTION OF OFFICERS.

Mr. Lansden, from Committee to nominate a board of officers for the ensuing year, presented the report of the Committee.

On motion, the President instructed Mr. King to cast the ballot of the Association for the election of the nominees presented by the committee; and thereupon the following gentlemen were declared duly elected officers of the Association for the ensuing year:

*President*—John Fullagar, Cincinnati, Ohio.
*First Vice-President*—E. McMillin, Columbus, Ohio.
*Second Vice-President*—G. G. Ramsdell, Vincennes, Ind.
*Secretary and Treasurer*—A. W. Littleton, Quincy, Ills.
*Directors*—W. A. Agard, Iowa; F. Beck, Texas; H. C. Clark, Missouri; T. Smith, Michigan; C. Collins, Tennessee; H. Pratt, Illinois; M. N. Diall, Indiana; J. Gimper, Kansas; J. M. Murphy, Nebraska.

NEXT PLACE OF MEETING.

Mr. Ramsdell, on behalf of Committee appointed to name the next place

of meeting, reported in favor of the city of St. Louis, Mo. On motion, the report was unanimously adopted.

### Report of Committee on President's Address.

Mr. Pratt, from Committee to whom was referred the President's Address, presented the following report:

We, the Committee to whom was referred the President's Address, respectfully report that we have examined the same, and would recommend that it be spread upon the records of this Association, and be also submitted for publication in the American Gas Light Journal. We commend its many practical and valuable suggestions and recommendations to the careful consideration of the members of this Association. Particularly do we call attention to the following points: The necessity of using every endeavor to further reduce the cost of gas manufacture, so that we may not alone meet the demands of the times, but also combat the would-be competitors, who, in the end, do not compete; how best to increase the consumption of gas, together with the importance of improved ventilation, in connection with the disposition and arrangement of gas burners in such manner as to greatly assist the working of same. There are many other matters of interest debated in the address that will at once attract the attention of members of this Association. We further recommend that the thanks of this Association be tendered to its President for his able and interesting message.

S. H. Douglas,
T. A. Cosgrove,
Henry Pratt, } Committee.

On motion, the report was accepted; and Mr. King tendered President Somerville a formal vote of thanks in accordance with the committee's suggestion.

### Printing the By-Laws.

On motion of Mr. Lansden, the Secretary was instructed to print 300 copies of the by-laws, the same book to contain a membership list of all those whose connection with the Association had been properly maintained.

### Reports of Standing Committee on Gas Commissions.

The Chairman announced that the Committee, appointed at the last annual meeting to consider and report upon the advisability, or otherwise, of urging the appointment of State Gas Commissions upon the attention of the Legislatures of the several States represented in the Western Gas Association, was divided in its recommendations. Two reports had been handed in, the minority report being signed by the Committee's Chairman, Mr. Samuel Prichitt, of Nashville, Tenn. It was agreed that the majority report be first read. Mr. G. G. Ramsdell, of Vincennes, Ind., thereupon read the following:

### MAJORITY REPORT.

*Mr. President and Gentlemen:*—One year ago to-day this Association appointed a committee of three to investigate the subject of Gas Commissions, and to report the result of its labors to this meeting. We regret to say the committee comes before you in a divided condition, as the chairman has felt it his duty to present a minority report. Your committee initially proved to be a very representative one, inasmuch as at the beginning of its labors one member was favorable, one unfavorable, and the third, or until he should study into the matter more fully, was unprepared to define his position. Until this latter was accomplished it was uncertain whether this would be a majority or a minority report.

We wish to say, at the outset, we entered upon our duties unbiased, and with a sincere desire to reflect simply that which is and shall be for the best interests of our industry, and have sought diligently to attain this result. We shall present no strikingly original features, but have, after careful consideration of the subject, deemed it best to confine ourselves more particularly to the evidence accumulated in our study and investigation of the question. We anticipate a diversity of opinion upon this whole topic; but we also recognize the fact that the work is necessarily a slow one—that we are simply taking the initiatory steps, and that, while the day is necessarily far off ere the full recommendations of your committee can be realized, yet we feel the importance of beginning the motion that shall lead up to its realization in all of our States.

No question is more prominently before us at the present time, certainly none of greater importance, than that of Gas Commissions.

One serious obstacle to an intelligent investigation of this subject is in the lack of such experience in this country; and while we have the experience of the old world, the fact remains that the difference in our surrounding circumstances is so great that that record is almost valueless except as a precedent.

With the approval of the committee, and for the purpose of verifying or disproving our position, a circular letter was prepared and mailed to every State in the Union, to some members of the fraternity residing in that State, whose individual opinions would be valuable as relating to the advisability of such process in their own States; and, collectively, that the prevailing sentiment might be obtained. Massachusetts was particularly appealed to, every company therein being requested to respond and testify to their approval or disapproval of the Commission in their own State—the pioneer in this country in the matter of Gas Commissions.

The following are the questions sent and replies received from the State of Massachusetts. Where a "qualified answer" is reported it means, the reply was so conditioned by an "if" or a "but" as to destroy its value:

Statement of Answers.

| | Yes. | No. | Qualified Answer. |
|---|---|---|---|
| 1. After an experience of 8 months do you approve of the State Gas Commmission? | 18 | 4 | 2 |
| 2. Does your Company or its Board of Directors have the same opinion of the Commission that you do personally? | 18 | 4 | 1 |
| 3. Would you recommend the adoption of a similar Board in other States? | 17 | 4 | 4 |
| 4. Do you regard the protection to gas companies, and gas interests, that it affords, an equivalent for the restrictions it will impose? | 18 | 4 | 2 |
| 5. Do you think it will protect gas companies from the attacks of "raiders" and other malicious blackmailing schemes? | 16 | 5 | 3 |
| 6. In your judgment is there danger of Boards, appointed in this way, becoming corrupt, or in any way using their official power to the injury of gas interests? | 12 | 6 | 5 |
| 7. Do you consider it equally desirable for small or large companies? | 16 | 1 | 2 |
| 8. Do you consider the Massachusetts law creating and controlling the Board as nearly perfect as possible?.. | 6 | 12 | 4 |
| 9. If a member of this committee, would you report favorably to the Association? | 16 | 4 | 1 |

These tables show that in Massachussetts, after a very limited experience—an experience, as more than one naively said, which has consisted almost entirely in answering about one hundred interrogatories—that about 80 per cent. favor Commissions.

About the same number, with their present experience, which we should remember includes the publicity of their business, in as far as the commission is concerned, recommend the adoption of similar boards in other States.

An equal number believe its benefits are at least equivalent to its restrictions. In regard to protection from "raiders" 66 per cent. believe in its efficacy. In regard to the probable integrity of the boards, we find the weakest response in the list; just about 50 per cent. have full confidence, while an equal number feel a considerable degree of uncertainty.

On the question of the completeness and adequacy of the Act governing the Massachusetts Board, only about 30 per cent. approve the present law, while over one-half of the whole number are entirely out of sympathy, alleging its insufficiency or impotency. Outside of Massachusetts the questions forwarded were quite similar, and were, with replies, as follows:

Statement of Answers.

| | Yes. | No. | Qualified Answer. |
|---|---|---|---|
| 1. Do you approve of State Gas Commissions, such as the one recently appointed and now in operation in Massachusetts? | 16 | 5 | 7 |
| 2. In your judgment would it be desirable to have a similar Board in each of the States? | 17 | 7 | 4 |
| 3. Would you consider the protection such Commissions afford an equivalent for the restrictions they would impose? | 13 | 8 | 7 |
| 4. In your judgment is there much danger of such Boards becoming corrupt, and using their official power to the injury of gas interests? | 8 | 5 | 15 |
| 5. Do you think there is any reason, why, if the Gas Commission of Massachusetts is successful and approved by the gas companies generally, similar Commissions would not be equally successful in the West and South? | 1 | 21 | 7 |
| 6. Do you believe that such a Commission in your own State would afford protection to the gas companies from "raiders" and "blackmailing schemes?" | 11 | 7 | 10 |
| 7. If you were a member of this Committee, with your present knowledge of the subject, would you report favorably or unfavorably? | 18 | 7 | 3 |

Of these, 50 per cent. approve of Commissions; about 55 per cent. consider the protection afforded unequal to the restrictions imposed.

On the question of the integrity of the boards again appears the great stumbling block; and, if anything, intensified. Nearly 70 per cent. are lacking in confidence, and very greatly fear the rectitude of boards appointed through the usual political channels. As before remarked, the proportion is greater here than in the Massachusetts replies, and it is also noticeable that the distrust increases with the distance as we move west. In direct contradiction to this the opinion is practically unanimous, "that, if successful in Massachusetts, there is no reason why it would not be in other States." Combination of these results does not materially change them.

Another line of testimony duly considered has been the utterance of those whose ability and recognized wisdom in gas matters called them to the presi-

dency of our various conventions; and we quote, as follows, from President Theobold Forstall's address to the New York Convention of the American Gas Light Association, held in Oct., 1883. He says:

"Uncertainty of tenure has been, and is to-day, an active cause of dear gas, and excessive dividends in anticipation of probable competition. Moderate dividends, well secured over a term of years, are more attractive to investors than large but uncertain profits, which may disappear at any moment by the unexpected votes of a few aldermen." After reviewing English history, up to and including the legal adoption of the sliding scale, he says: "Is it not a sad commentary on our boasted enlightenment that all this costly and fruitful experience has been wasted upon us; that while, step by step, the English legislature has been working toward a true solution, harmonizing all interests, our lawmakers are still floundering in ignorance, imposing upon the public all the annoyances and losses from which our English cousins have safely emerged?" And again: "Another great advantage which would accompany the adoption of English gas legislation would be the publication of the accounts of the companies in such form as to exhibit the actual cost and profits of the business. * * * The knowledge by the consumer that the affairs of his gas company were as well known to him as those of his bank would remove much of the prejudice and suspicion which he now harbors against it. * * * I am daily more impressed with the necessity that this whole question be placed upon a proper basis without delay. * * * It cannot be reached without effort; and the effort must be made by the companies."

J. B. Howard, President of the Western Gas Light Association, at the St. Louis meeting in 1884, says: "The problem which is now anxiously being inquired into, with a view of seeking its true solution, is whether a business in which the price charged is not controlled by competition, can be equitably regulated by legal enactments. * * * I believe, as I have heretofore stated, that the true solution will be found in some broad principle, the operation of which may happily be in some manner self-regulating—for, as everyone knows who is at all acquainted with our politics, or rather our politicians, the less we leave for it, or them to do, the better off we find ourselves. * * * A solution will no doubt sooner or latter be brought about. I am sure the gas industry of the country will hail the solution with joy as giving permanency and stability to our investments, while disabusing the public mind of the idea that our profits are fabulous when they are only legitimate."

Wm. A. Stedman, who presided over the Washington Convention of the American Gas Light Association in 1884, says: "My predecessor in this chair last year concisely stated the advantages to be derived from governmental regulation. I wish to urge upon this meeting a reconsideration of this subject, as he presented it, and to take action to hasten the adoption of the measures recommended by him. The news of a decided move in the right direction comes from the city of Boston, where Alderman Greenough has proposed, and the proposition has been adopted, that the Legislature be asked to establish a Gas Commission. This comes from the right quarter; and the honor of the first just conception of the mutual obligations between communities and the gas companies who serve them, and of an intelligent and equitable adjustment of those obligations, will probably belong to a Massachusetts Legislature."

T. G. Lansden, who presided at the Chicago meeting of the Western Gas Association, 1885, says: "As it appears in the nature of an impossibility to make the public feel that our interests are mutual, I heartily concur in the idea that is being advanced in some of the States—that of having a State Gas Commission, similar in nature to those at present having charge of the railroads. This is, in my opinion, the only way the problem will ever be solved. The time has gone by when gas companies should expect to realize more than 10 per cent. on their capital. I think a large majority of them would now welcome any movement which would tend to place their capital in a safe position. Anyone who will take the trouble to go over what has been done in Europe will see that this was there the last resort; and the method has come quite near to effecting a solution of the problem. * * * I feel sure that a majority of gas companies would do all in their power to assist in the movement for State Commissions."

At the last Convention of the American Association, held at Cincinnati, in October, 1885, President Vanderpool, after alluding to the raiding process, says: "This evil never was so rampant as now; it is our great danger, and threatens, not only to ruinously overburden our industry with unnecessary and wasted capital, but also to make successful competition with other systems of illumination difficult, if not impossible, with profit.

"It is cause for sincere regret that so little has yet been done towards the regulation by the State of the profits, duties and privileges of gas companies, and towards the protection of their property, invested in good faith and in such a manner as to be useless for any other purpose.

"We regret that more prompt legislative action was not taken in the State of Massachusetts, whose principal city had been supplied for many years by one company that, without legal restriction or control, and unthreatened by raids upon its property, had adopted and carried out the policy of supplying the best gas at as low prices as were consistent with what is recognized, among conservative financiers the world over, as a moderate return upon the capital actually invested. Notwithstanding this condition of affairs, and the absolute demonstration of its great superiority to the municipal authorities, the latter, without regard to the interests of the consumers, and in the absence of laws such as are provided in other civilized countries, granted the right to open their streets to so-called competing companies, and thereby forever fastened a grievous burden upon every gas consumer in their city.

"This action of the municipal authorities has shown most clearly the necessity of placing the determination of the serious questions regarding the supply of gas in the hands of intelligent and unbiased men, appointed by the State, who would have the time to thoroughly consider them, and who would be honest and capable to act as arbitrators between the public and corporation.

"Our relations to the public are more peculiar, close, and intimate than those of any other corporations.

"The principal is now universally recognized and acted upon among ourselves that our consumers are entitled to receive the best service we can render, and that our charge for this should be only sufficient to cover its cost and secure a fair dividend for our stockholders upon the capital actually and prudently invested. But however desirous we may be to carry out these principles, the fact remains that man is a suspicious animal, and prone to take undue advantage of his opportunities.

"It is not creditable to this great country that we alone among civilized nations permit a system that inures solely to the pecuniary advantage of speculators, who place the permanent burden of dear gas upon the public they have so easily cajoled.

"No argument is required to prove that competition in the manufacture and supply of gas is impossible. Experience teaches, without an exception, that 'where combination is possible competition is impossible, and in every case has resulted in consolidation, division of territory and an agreement not to compete, the pooling of profits, or in the extermination of one of the companies, followed by an increase in the price of gas to consumers to compensate for losses and to pay dividends upon unnecessary and unproductive capital.'

"There seems to be but one complete remedy for these evils, and that is placing our affairs under legal control, so that the public will know that it has a representative compelling the company to furnish the best service at reasonable rates, and the company will know that, as a consideration for these services, it will be entitled to receive a fair return on its capital and enjoy a permanent and secure franchise, not subject to attack from speculators or adventurers."

You will, perhaps, note that no extract has been given from the able address of President Hickenlooper, delivered at the Pittsburgh meeting, in 1882. We have chosen rather to add to his endorsement at that time his recent utterance at the meeting of the Ohio State Association, held in March last, at Springfield, Ohio, in which he very fully treated the subject, as follows:

"Just how far this legislative control should be exercised is a debatable question; but it should certainly go to the extent of protecting the consumer against unreasonable exactions, and the companies in the undisturbed enjoyment of fair and reasonable profits upon their invested capital.

"Any State Commission should, as nearly as may be practicable, embrace a representative of each of the interests involved—of the State, of the companies, and of the municipalities; the first to be appointed by the Governor, the second to be selected by the gas companies of the State, and the municipality to be represented by its chief executive officer. The first should possess legal, scientific, and clerical ability of the very highest order; the second should be a gas engineer eminent in his profession. These two should be appointed for a period of not less than five years; be required to give their entire time and attention to the duties of the office; be paid a salary of not less than $8,000 per annum; should be furnished with a well appointed and thoroughly equipped department in the Capitol of the State—placed under their exclusive charge for test and experimental purposes; and they should be at all times prepared to furnish accurate, detailed information in regard to the industry they represent. The chief executive of any city or town to be called upon to act as a member of such Commission whenever proposed action directly affects the interests of the municipality he represents.

"Such Commission should first be required to make a thorough examination of the business and financial affairs of existing companies; and, from such examination, coupled with due consideration of the present and prospective requirements of the business, fix and determine upon a fair and reasonable allowance of capital representing invested values, or necessary for properly conducting the business. With this as a basis, they should then definitely determine upon the divisible profits to be allowed upon authorized capital uniformly throughout the State. They should then prepare a bill

expressing with great exactness the rights, duties, and obligations of both manufacturer and consumer; confining their own discretionary power to the narrowest possible limits, but investing them with ample authority to enforce an exact compliance with the law upon the part of municipalities, as well as corporations accepting under its provisions.

"In the absence of general detailed information and official statistics, it is impossible to even approximate to an indication of all the necessary details and provisions of such an act; but in general terms I would say that, under existing circumstances, companies now doing business in this State (Ohio) should be permitted to accept on a capital basis of ten ($10) per thousand cubic feet of sendout. That upon such authorized capital they should—after due and proper allowance for maintenance of plant—be permitted to make a divisible profit of 8 per cent., and accumulate a reserve fund, at the rate of 2 per cent. per annum, until it amounts to a sum equal to 10 per cent. of the authorized capital; such reserve to be drawn upon only in case of unavoidable accidents, unexpected enhancement in the value of the materials used, great temporary depression in business, or other unlooked-for contingencies, that would render it impossible to earn in any one year the authorized dividend.

"Whenever any company has secured the authorized reserve, and demonstrated its ability to earn the maximum dividend, it shall call upon the Commission to make an examination of its accounts; and, upon the basis of the last preceding year's receipts and expenditures, to fix and determine upon the price at which it shall thereafter sell gas to public and private consumers in order that they may realize the required profit. That it shall not, for a period of 25 years thereafter, be legal to charge more, or require such company to furnish gas at less than the price thus fixed and determined upon; but that, for the purpose of insuring the utmost economy in the manufacture and management, any company so electing may at any time reduce the price below that indicated, and, in consideration of such reduction, shall be permitted to increase their authorized annual dividends to the extent of 1 per cent. for each and every reduction of ten cents per thousand in the selling price. That existing gas companies should have a reasonable time, after the final passage of such a bill, within which to examine and consider its provisions; pending which examination no authority should be given for the establishment of additional companies.

"Whenever any company officially signifies to such Commission its desire to accept under the provisions of such a bill, it should not thereafter be lawful to authorize the establishment of any other gas company within the territory occupied by such existing company. That such acceptance shall constitute a contract between the corporation and State, the terms and provisions of which should not thereafter be subject to amendment or appeal, except by mutual consent. Such an arrangement would, in my opinion, prove eminently satisfactory to all concerned."

It will thus be seen that since 1881 scarcely a convention has been held at which the endorsement of the President was not unmistakably placed upon this important question. A vast amount of other evidence might be added, but only a few brief individual expressions will be used.

"I think an honest and fair commission, acting independently as an umpire between unreasoning prejudice on the one hand, and selfish interests on the other, cannot help being reasonably fair to both."—R. Spencer, Burlington, Iowa.

"Any body of intelligent and irreproachable men appointed by the Governor, and with proper restrictions as to their duties, would be a great mediator between gas companies and their customers"—Thos. Turner, Charleston, S. C.

"To my vision the question is so clear that no argument is needed to prove the necessity of such a Commission * * * It may be our neighbor's funeral to-day; but it is only a question of time when we must join the mourners, unless we protect ourselves from blackmailers by legislation."—F. C. Sherman, New Haven, Conn.

"I approve of Gas Commissions. I think the chances would be in favor of their affording protection if governed by wise statutory regulations. I think it is clear some such action should be taken."—A. B. Slater, Providence, Rhode Island.

"In my opinion all companies will, in the near future, be liable to regulation; and if they are to be controlled, let them unitedly strive to have laws passed which will be just to the producer as well as to the consumer."—J. B. Crockett, San Francisco, Cal.

"I am of the opinion the Commission will stop raiders, and, therefore, be desirable. * * * Proper restrictions are right—if your property is protected. I would be glad to have such a Commission."—Geo. A. McIlhenny, Washington, D. C.

These are the briefest possible extracts from a large correspondence of the same tenor; and but a small proportion of their argument.

To the foregoing should be added the many able editorial arguments which have from time to time appeared in the columns of the American Gas Light Journal, and which have invariably pointed in one direction, and that towards the establishment of Gas Commissions. Much of the opinion prevailing in the fraternity is due to the educating influence of these articles, as they have permeated a much larger area than the utterances of any single individual.

Thus it will be seen the evidence supporting Commissions is abundant, full of sound reasoning, and carries the weight of convincing power inspired by the knowledge we have of the authors. We will now turn to the views of those opposing Commissions.

As already shown, the opposition is decidedly in the minority, only 8 per cent. being unequivocally opposed and favoring an unfavorable report. Of these it should be said they are representative men whose opinions are valuable, and whose opposition is positive and decided. About the same percentage favor Commissions, but interpose two other objections. 1st.—The danger of the integrity of the Boards. 2d.—The lack of a suitable law—the latter being the princpal objection urged.

We, therefore, find (1st) the preponderance of evidence is in favor of Commissions; (2d), that 8 per cent. are unequivocally opposed; (3d), that 15 per cent. are opposed *unless* a better law is enacted for the control of the Commission than provided by the Massachusetts law; and (4th), about 12 per cent. fear the integrity of the Boards.

Let us briefly consider these points in their order. 1st. The first (8 per cent.) equally represent four geographical sections; and perhaps the best answer to them lies in the fact that their opinions are so greatly overbalanced in their respective districts, and by judgment of perhaps equal ability. 2d. It is very evident, not only from replies received, but from a careful perusal of the Massachusetts Act, that it is somewhat defective regarding gas companies as well as the Board itself, which is clearly shown by their first annual report, issued about February 1st, 1886. This report is a very fair and able document, and goes far to recommend the Board to those who are under its control. The report calls attention to the inadequacy of several provisions, and suggests relief by proper legislation. It strongly approves the English system of a standard quality, standard price, and standard rule of dividend. In unmistakable language it disapproves of so-called competition, and sustains its opinion with sound argument. It calls attention to defects in the present act, and clearly foreshadows important and desirable changes. It is full of valuable features, but impresses one more with the idea of its future perfection than its present value.

The defective points urged as existing in the Massachusetts law are, first, the disbarring of any person who has any knowledge of the gas business. The salary is not an adequate compensation for the services of competent men. The clause covering the subject of complaints is too loosely drawn; and its provision regarding opposition companies is no stronger than the present law in most of our States. Perhaps we should be content to creep before we walk. We understand, from excellent authority, that the law was the best that could be successfully carried through the Legislature *at that time*, and was adopted as a stepping-stone to future completeness in strength and scope, until it afforded ample protection alike to producer and consumer. The result of its brief existence affords a striking illustration of the fact that it is only necessary to show men, whose minds are broad, equably poised, and sufficiently impartial to consider important matters, that the interests of producer and consumer are identical, with the logical sequence that in benefiting one they benefit the other.

Now as to the integrity of the Boards. We believe it is more a question of the integrity of the State—"As the fountain so the stream." Such legislation should accompany the appointment of any Board as will at once place this matter out of jeopardy.

We therefore recommend—

1st.—The establishment of a Gas Commission in each State.

2d.—The enactment of suitable laws to govern and control such Commission.

3d.—To accomplish the above, we suggest the formation of State organizations in each State.

As to the general terms of the law, it is further recommended that in each State a Board of Gas Commissioners shall be appointed by the Governor, to consist of three members, one of whom shall be appointed upon the recommendation of the State Association, signed by the President and Secretary.

That the term of office should be for two, four, and six years for the first appointees; thereafter, for six years each. That the retiring member of the Board should be its Chairman. That the Governor should have the power to appoint or remove. That upon the expiration of the term of office of the Commissioner recommended by the gas companies, through its State Association, his successor shall be appointed in the same manner. That the salaries of the Commissioners shall not be less than $6,000 per annum; and the allowance for procuring necessary statistics and information be ample to cover the same. That after thoroughly examining the business and financial affairs of existing companies, it should prepare a law authorizing an authorized capital per thousand cubic feet of gas manufactured. That upon

his authorized capital a certain rate of dividend be allowed, and a certain reserve.

That if after these points are adjusted any company, by superior management, can earn more than the prescribed amount, it shall be entitled to an increased dividend in just proportion to the reduction afforded the consumer. Taking the figures quoted in this article, this would be as follows:

Authorized capital, $10 for each 1,000 cubic feet manufactured.
" dividend, 8 per cent. upon above capital.
" maintenance, 2 per cent. " "
" reserve fund, 2 per cent. " "
" Increase of dividend, 1 per cent. for each 10 cents reduction granted in the selling price of gas.

That when the conditions are complied with no other company should, under any circumstances, be allowed to occupy the same territory.

Respectfully submitted, { Geo. G. Ramsdell, { Thos. A. Cosgrove.

Secretary Littleton, at the request of Mr. Prichitt, here read the

## MINORITY REPORT.

*To the Western Gas Association:*—The subject of a Gas Commission, upon which your committee is expected to report, opens a wide field for conjecture as to its possibilities for good, and its greater possibilities for evil, to the gas interests.

It is unnecessary to state that a demonstration of the fact that such a Commission would effectually afford protection to gas companies from blackmailing schemes and raiders, without introducing a worse and more weakening malady, would be accepted by the gas interests with great unanimity; but when the subject is critically examined, and all the germs of weakness and corruption exposed, it becomes a serious question, calling for much hesitation in its introduction as a part of the machinery in making cheap gas, and satisfying the public.

Such a Commission is but the creature of the political power creating it, deriving its existence from political influence, and therefore becoming a part of the political machinery of each State, subject to all the uses usually made of patronage for serving personal rewards, and party purposes. The danger will be at once seen that the operation of such a law will combine the elements of corruption, bribery and blackmail in a concentrated form, at once more menacing to gas interests and the millions invested, and corrupting in its influence, than are now suffered in any other forms of persecution. It is but another step in the multiplication of political offices, to be used as so much property by the leaders of political parties, subjected to a changing influence, as parties decay, and used as an inquisitorial machine to extort money at the expense of gas companies for political purposes. It becomes another question altogether, to moralize upon the virtues of the human race and the probabilities of such a Commission being free from corruption. Experience is worth all the theory that can be advanced, and we need only to open our eyes and look about us to see the inevitable complexion such creations assume.

In considering the question of a Gas Commission we must rely to a great degree upon our observation of the operation of such semi-political bodies, and upon a theoretical judgment as applied to this particular interest.

There is, as yet, no practical experience to guide us as to the workings of a Gas Commission.

It is true there is a Board of Gas Commission in operation in the State of Massachusetts; but there has been no distinct record made by it that indicates either benefit or the reverse. Nor has a plan appeared looking further than the collection of statistics and receiving an exposition of the business of the gas companies, and drawing—salaries. Hence there is no reliable data upon which to base an opinion as to what may be expected of this Board of Gas Commission; and we can do no more than surmise, and reach conclusions based upon our general experience, and on general principles, which furnish many reasons against favoring such control.

The general danger of corruption in all political appointments, having under quasi control such an immense invested capital (which has been put under contribution heretofore in defending itself against gigantic efforts to blackmail, and which it is believed, will only excite an appetite for additional imposition), is sufficient to excite the gravest fears.

Considering this question as one of sentiment, and upon a basis of having an ideal Commission, composed of honest, fair-minded and intelligent men, a solution would appear quite easy; or viewing it as embracing a plan by which the gas companies themselves could have the controlling voice in selecting the material, it is believed would resolve the subject to such shape as would engage the support of this Association; but considering the matter from such a standpoint, is it a practical possibility, or can it be expected that the periodical succession of such a body will always be susceptible to the best influence?

To say that a gas company would oppose a Commission composed of honest, fair-minded and intelligent men, would argue that the gas companies desire obscurity and unfairness, which your committee feel sure is not the fact; but if a Gas Commission is once organized under a just and favorable law, and composed of such material, it is an open question, and subject to much doubt, if such a Commission can, or will, be maintained unbroken for a series of years.

Theoretically, we can all agree that a fair and honest Commission would prove of benefit and protection; but this does not appear to be the real question. Practically, the question is whether such a Commission can be maintained free from direct and palpable jobs, independent of politics and free from the influence and control of the adventurous blackmailers, against whom those who favor a Commission now seek to be protected.

This report omits much that could be properly said as to the influence exerted by the details of the law controlling the operation of such a board; and much would depend, of course, upon the powers conferred by said law—its mandatory and inquisitorial sections—and whether said law was framed for protection or for harassing purposes.

Much also might be said as to the possible lack of experience and ignorance on the part of the Board of Commission, or lack of special qualifications, enabling them to deal intelligently with a special branch of manufacture. Much also would depend upon the term of service of said board; but an elaborate discussion of the many features presented, in considering this question, is beyond the scope of this paper.

The compensation of such a board, it appears, would of necessity be a charge upon the earnings of the gas companies, and the amount to be paid *should be sufficient to engage ability and intelligence* capable of dealing with the subject upon a broad and liberal basis.

It becomes a question, then, if gas companies are ready to assume this additional charge upon their earnings, with such a doubtful benefit to be derived.

In the consideration of this subject your committee would not lose sight of the duty of gas companies toward the public. Gas companies enjoy peculiar franchises, granted to them by public favor, and should be controlled by an effort to so use these privileges as to return to the public the benefits contemplated by the granting of rights of way upon public streets; and this portion of your committee is therefore inclined to view the matter just as any other business enterprise, and consider the most valuable protection would be an ability to produce gas at a figure which would admit of no necessity for such supervision or protection.

The annoyance of an investigation, upon slight and frivolous pretexts, is a subject deserving mature reflection, before advocating a step which, if proven an error, will be difficult to recover from, or retrace.

Briefly summarizing, it will be readily admitted that a Board of Gas Commission will be of benefit to the gas interest, if appointed and annually maintained without variation under the following conditions:

A wise and intelligent law without burdensome exactions and regulations of a harassing nature, and not permitting frivolous application. A commission composed of men of high character for honesty and integrity, and possessing some knowledge of the business proposed to be controlled.

Many would probably favor a commission relying upon a hope of being able to control the appointments, or at least being able to control the Commission after appointment. In this case the door is opened wide for political trickery, bribery and corruption, with the concomitant of blackmailing.

On the other hand, a Commission appointed in the interest of the gas companies would work an injury, as being worse than no Commission at all for the purpose of allaying any hostility on part of the public, and would prove ineffectual as a protection, because of the uncertainty of tenure and liability to be succeeded by open hostility and menace.

The question is, admitting all that is claimed for an honest and well regulated Commission, can such a Commission pass through the political atmosphere surrounding State Legislatures of to-day, composed of the present average statesmen, and maintain an unbroken freedom from taint, political bias and corruption?

Are they to be considered proof against the raiders themselves; and may they not become an active instrument for useless and frivolous annoyance?

If legislative protection is needed or desired, it would appear more preferable to have direct laws regulating the profits to be distributed, and the reduction in price of gas to consumers for every per cent. added to the distributable profit, *and permit no competition.* This would, of course, carry with it a wise provision of reserve for extension, maintenance, etc.

This portion of your committee, for the reasons outlined, is therefore inclined to report adversely upon the question. Sam'l Prichitt,
Of the Committee.

[To be continued.]

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The Edison incandescent system of lighting was responsible for a fire in the store of Messrs. Marsales & Halstead, Rockford, Ills., one evening last month. The damage figured up $2,500.

[Official Report.—Concluded from Volume XLIV., page 354.]

## Second Annual Meeting of the Ohio Gas Light Association.

Held at the Arcade Hotel, Springfield, Ohio, Mar. 17 and 18, 1886.

Second Day—Morning Session—Tuesday, Mar. 18.

Mr. E. B. Philipp, of Findlay, Ohio, presented and read the following paper on the subject of—

### NATURAL GAS AS A COMPETITOR OF COAL GAS FOR ILLUMINATING.

*Mr. President and Gentlemen:*—The subject matter of this paper, as to my experience with or knowledge of the question treated, will, I trust, be received kindly by the fraternity. The purely practical side of the question will be discussed, and no reference will be made to any theoretical matters that may be in dispute or doubt. In fine, I propose simply to give our practical experience, and the results obtained therefrom, in the use of natural gas as an illuminant.

Somewhat more than a year ago, our company (the Findlay Gas Light Company), which had supplied the city with coal gas for a period of ten years, was driven into the natural gas field on account of the formation of an opposition company. The result of the latter's test well, and the knowledge of the fact that its managers had secured a franchise, led us at once to drill for natural gas. A good flow was secured, and without any investigation as to its quality or nature, either by chemical analysis, or through photometrical tests, we turned it into our holders, and furnished it, in its crude natural condition, to our consumers. The fact that opposition threatened to vitiate our plant, made us desire to be in the lead over our competitors in the race; and with our coal gas mains in the ground, and our connections and services already made, we, of course, had a decided advantage. This will account for the seemingly unwise and hasty action then taken.

The change from a 16-candle coal gas to crude natural gas, burned through imperfect burners, was very marked, and was decidedly dissatisfactory to our consumers and to ourselves.

Without knowledge of its qualities as an illuminant, and without burners especially adapted to its consumption, our experience at that time would certainly lead us to report unfavorably upon its employment. However, having been driven into the use of natural gas, much against our inclination and judgment, we determined to "take the bull by the horns," and learn practically if anything good in the way of results could be secured from it. The fact of its being a powerful and cheap source of fuel was apparent, and well known to us; while the fact of our ever being able to satisfactorily use it as an illuminating agent remained undecided.

With the knowledge obtained from investigations previously tried in a crude way, we made tests for its chemical constituents; also in regard to its practicability as an illuminant from a photometrical standpoint. The result of the chemical analysis (kindly made for us by Mr. E. McMillin, of Columbus), is as follows:

| Constituents. | Per Cent. |
|---|---|
| Ammonia | .00 |
| Sulph. Hydrogen | .88 |
| Carbonic Acid | .88 |
| Bisulphide Carbon | .00 |
| Illuminants | .50 |
| Oxygen | .00 |
| Carbonic Oxide | 2.00 |
| Marsh Gas (probably) | 95.74 |

These figures show, that on account of the excess of sulphuretted hydrogen and carbonic acid, and the absence of free hydrogen, the specific gravity of natural gas is greater than that of coal gas. Owing to this the flame flickers, is readily disturbed by draughts or currents of air, and thus the light, when burned in the open air, is somewhat unsteady.

The excess of carbonic acid materially affects the candle power, for we know that carbonic acid is an exceedingly pernicious compound, acting in most detrimental manner on the illuminating power of the gas with which it is combined. In fact, a content of only one per cent. effects a reduction of seven per cent. in the illuminating value.

The excess of sulphuretted hydrogen, while making the gas somewhat unpleasant when burned in crude state, is not without redeeming feature, for it imparts a pungent odor to the gas and thus lessens the danger that might arise in case of excessive leakage. In this regard the Findlay gas is much safer than the Pittsburgh natural gas.

The results of our experiments, after much labor and expense, have been successful; and we now have the satisfaction of giving our consumers a fair light of from 12 to 14 candles. The record of our photometrical tests will show that to be absolutely true.

Throughout all our researches we were obliged to depend solely upon our own experiments and investigations. The fact that natural gas had been used to only a slight extent in the Eastern oil and gas fields gave us no reliable data from that source. The Eastern figures, as far as they went, were very discouraging. The further fact that such a great difference exists in the quality and nature of Ohio and Pennsylvania natural gas, would also have prevented us from being guided by such data, were the latter ever so voluminous.

Briefly stated, our results are as follows: The best form of burner for the consumption of natural gas, as with coal gas, is the Argand. The kind of Argand which we find affords the best service is a 36-hole lava tip, made by E. P. Gleason & Co. With this burner, by accurate corrected tests for candle power, we find an illuminating value of 12.57 candles.

Where a flat flame is required for the purpose intended, we generally employ the various sizes of Bray's goods. The 60-candle power burner of this make gives a corrected illuminating value of 10.85. We also employ another flat flame burner—the No. 60 American Meter Company's special batswing—from which we obtain a corrected candle power of 11.57. This will be noted as better than the duty secured from the Bray.

These tests were made on the crude gas; the instrument used being a 50-inch bar photometer, and for which we are indebted to the kindness of the American Meter Company.

By passing the gas through lime-filled purifying boxes, and removing the carbonic acid and sulphuretted hydrogen, we obtain a candle power of 13.77, a gain over best Argand showing on crude gas of 1.20 candles.

The above tests, remember, are for corrected candle power; the candles being accurately weighed, and the calculations based on the sperm consumption of 120 gr. per hour—the consumption of gas being the standard five cubic feet per hour. This showing was a matter of surprise to us; but the figures are true and accurate. We were kindly assisted in the photometric tests by Mr. J. R. Smedberg, to whose knowledge and experience we are much indebted.

We have in use quite a number of regenerative lamps, and these give us very good results. As with coal gas the Siemens' lamps take the lead. A regenerative burner (the result of local experiment) called the "Houpt," also does excellent work. The Houpt is, in some respects, even better adapted for our natural gas than the Siemens.

The best general lighting results are obtained when using burners rated to consume from 8 to 9 cubic feet per hour. At that rate of burning it gives a good and satisfactory light, excelling, in a number of instances, some qualities of coal gas. With this data before us, we may claim to have a fair quality of gas, above legal Ohio standard, which we furnish to our consumers at a very low price. Discarding the use of meters, we sell it by the tip or burner, charging from 15 to 30 cents per tip per month, according to the number of hours used.

This price is for flat flame and Argands. For regenerative burner consumption we charge more. At this price, estimating the average yearly number of burning hours at 1,400, with a consumption of 8 feet per hour, at an average cost of 20 cents per month, or $2.40 per year, we receive between 20 and 24 cents per thousand for our gas.

A few facts of direct comparison between coal gas and natural gas, as to relative cost, may be of interest from a financial standpoint: A drygoods store, where the annual coal gas bills formerly amounted to between $400 and $500 per year, is now lighted with natural gas at a cost of $144 per year. A saloon and restaurant, where the yearly coal gas charges were from $300 to $400, now pays $120 per annum for the natural gas. A private residence where the coal gas bills formerly footed up to $30 or $35 per annum is now lighted at a cost not to exceed $7 or $8 per annum.

In making these comparisons it must be borne in mind, as no meters are used, that from 50 to 100 per cent. more gas is now consumed than was the case when coal gas was used—the latter, of course, having been sold by the thousand cubic feet. On account of the no-registration plan the gas is used very lavishly, and without any regard for economy. Storerooms, where every economy was exercised in the use of coal gas, when they were only sufficiently illuminated to meet the absolute wants and requirements of business, are now a blaze of light. Private residences, which formerly had only a burner here and there, are now a blaze of light from cellar to garret. The street lamps, formerly lighted with 4 and 5-feet burners, are now lit up as if the town were illuminated for some special occasion. These facts and figures are practically of use in the solution of the problem as to the likelihood of natural gas becoming a competitor of coal gas as an illuminant.

One decided improvement in our present system might well be made. That is in the way of purification by lime, which process would remove the excess of carbonic acid and sulphuretted hydrogen, thus increasing the illuminating power, and doing away with the sulphurous odors evolved in burning, and also materially helping the steadiness of the flame. This step of purification, however, while it would certainly benefit the gas as stated, is not now practical with us, on account of the size of our city. The consumer is unwilling to pay a cent more for it, should it be delivered to him in a purified state. In a large city, however, the process of purification could be advantageously, and in a pecuniary sense as well, carried on. We have, in a number of ways,

tested the practicability of enriching natural gas, and with some success. But, as said about purification, the enriching scheme is impracticable with us at present. The enriching results have been encouraging enough to warrant its being done where the circumstances of a large and populous center would make it feasible. Natural gas mixed with coal gas has been used in various places in the East, and with good results.

Summing up our entire practical experience in the matter, we must admit, contrary to our original expectations, and contrary to what we considered in the beginning as good judgment, we will continue to furnish natural gas as an illuminant, as long as our wells last. I can say from a purely practical standpoint, substantiated by our results as given above, that natural gas—not only as far as Findlay is concerned, but so far as any other locality may be concerned, where the gas found is analogous to that of the Findlay wells—has become and will most undoubtedly remain an active, live, competitor of coal gas. It can be metered, at a good profit, at less price per thousand than it now costs for the mere distribution of coal gas. The various uses to which natural gas may be applied are many. I will willingly give the results of our observation and experience in regard to these at any subsequent time; but in this paper I have confined myself strictly to the subject-matter assigned me. The data of the various experiments and tests, from which the results given were obtained, are too lengthy to be detailed in this paper. They are, however, attached to, and are a part of it, and are at your service for examination. I will say, in conclusion, that we will gladly welcome, at any time, any of the fraternity, who may have an interest in investigating and seeing for themselves this natural and wonderful product. Come; and welcome.

On motion of Mr. Printz, a vote of thanks was passed to Mr. Philipp.

*Discussion.*

Mr. Somerville—Do not the consumers complain about the smell of the gas?

Mr. Philipp—When we first sent it out as an illuminant, on account of the imperfect burners, some complaint of that sort was made; but we hear little about it now. It has a tendency, however, to deposit a sort of white precipitate on the ceilings and walls of small rooms. It can be easily wiped off with a dry cloth.

Mr. Somerville—Is there any complaint about a bad effect upon the health of the people?

Mr. Philipp—I have been working in the midst of natural gas for the past year; and I do not think my health has been affected. One trouble with natural gas arises from the excessive temperature to which the rooms are heated. It is no unusual thing to experience a temperature of 75° or 80° in rooms lavishly illuminated and heated by natural gas. The people living in such warm rooms are liable to take cold when they go out into the open air; and the use of natural gas as a fuel may, for that reason, have a tendency to cause ill health. Physicians have paid much attention to this matter of sulphurous impurity in the air respired in apartments lighted by natural gas, but, as far as I know, they have not found it to be dangerous.

The President—Have physicians complained that such excessive heat in houses has been the cause of pneumonia in an epidemic form?

Mr. Philipp—They claim it would tend that way.

The President—Have you a regular scale of prices; and does it vary much in the figures charged for gas used in lighting and in cooking and heating? Do you make your own prices; or are they regulated by the Councils?

Mr. Philipp—The fact is the opposition tactics during the first year of the use of natural gas now operate as a great detriment towards regulating any price. The strenuous effort of the original natural gas company, or the one which investigated the subject, to introduce their plant, and to secure the bulk of the business, was such that it went to all lengths to obtain consumers. Finally, after fighting for seven months, we shook hands and came together; and now it is a consolidated company. The Common Council attempted to create, by ordinance, a schedule of prices by which we shall be governed.

The President—Will you be able to declare a dividend at the prices proposed by Council?

Mr. Philipp—It would be utterly impossible for us to do business at the suggested prices and make money. If these rates are ordered by the Council we shall have to close our wells and ship our gas somewhere else, or else allow the plant to stand idle. In fact, the present price of natural gas, as sold in Findlay, is lower than in any other town in the country, and by reason of the contention at the beginning. We furnish an ordinary house with fuel and lights for $30 or $35 per year; and hotels get fuel and light for about $240 per year. For our street lamps we receive $6 a year. The average price of gas to stoves, during the seven cold months, is from $1.50 to $2.50 per month. Occasional fires, or those lighted in upper rooms, such as bath and bedrooms, etc., are supplied for $1 per month. In summer we charge $1 per month for gas supplied to a cooking stove. For ordinary burners we get 15 to 30 cents per tip per month, according to size and number of hours used. For regenerative burners we get $1 per month. The Common Council, in their judgment, wish to ordain that we shall supply gas to stoves for 50 cents per month. In other words, a hotel shall have cooking gas for 50 cents per month per stove; stoves in a private residence shall be charged for at the same rate. Irrespective of the number of hours in which burners are in use, they propose to make us furnish gas for illuminating at five cents per tip. For fuel purposes, irrespective of whether it is for a store, or an office, or a church, they propose to make us charge $1 per month per stove. Such are the main features of the proposed ordinance.

Mr. Somerville—Has any diminution in pressure been noticed at the Findlay wells?

Mr. Philipp—When first struck the gas comes up with considerable volume and force, especially if it be discovered in new territory. It then decreases to the nominal flow of the vein or well; and in that normal flow I have not noticed any diminution since the start—about 14 months. Eastern experience with gas wells has indicated that they are long lived.

Mr. Lee—What pressure do you carry on your mains?

Mr. Philipp—The highest pressure on our mains has never exceeded one pound, and our lowest pressure never goes below two ounces, although the initial pressure at the wells is 450 pounds to the square inch.

The President—While we are discussing natural gas as a possible opponent to coal gas, because of its great cheapness, I may call attention to the fact that we have a gentleman in our midst who is quoted as an authority for the statement that coal gas can be produced at 30 cents per thousand. We would like to hear his experience. I believe that coal gas, at those figures, is the only opponent that we can interpose to the introduction of natural gas. We would like to hear from Mr. Green on that subject.

Mr. Green—I have been waiting for the time to come when I could make a statement. It has been asserted here on the floor that the figures given by me, as Supt. of the gas works at the Ohio Penitentiary, on the cost of the coal gas made in that institution, only represented the cost of coal carbonized. I confess I am astonished that men placed in position to know differently should stand up here and make any such statement. My books are public, and must be brought forth when called for. Now, if I make false figures it would be an easy matter to disprove them, and how speedily the gas men would "make Rome howl" for an investigation. Let me say right here I do not think there is a single penny which should be charged to manufacture that is not so charged. Every pound of coal, and (as nearly as they can be accounted for), all the incidental expenses, including labor, interest on the investment, etc., enter into the account, and are set forth in the reports. It places me in rather peculiar circumstances, and in rather an embarrassing position to hear such assertions made; and I think it is due to me that those who made such assertions should retract them. I do not like the idea of such statements going before the thousand and one readers of the American Gas Light Journal. It is simply nothing less than a charge of fraud or perjury; and I do not at all feel like standing under it. If it is necessary I can produce the detailed statement.

The President—Have you got the statement with you?

Mr. Green—No, sir, I have not.

The discussion on the cost of gas made at the Ohio State Penitentiary Gas Works was carried on at great length. Mr. Green stoutly contended that he could prove his position, while others were disposed to the view that much harm was done to the commercial position of the gas interests of Ohio by the statements which emanated from the operators of the Penitentiary gas works. It was finally determined that the Chairman should appoint a special committee of three to visit the Penitentiary gas works to make an exhaustive investigation of the workings of that plant; also to make special note of how Mr. Green's previous statements corresponded with the facts developed by the inquiry. The Chairman appointed, as such committee, Messrs. E. McMillin, R. P. Green, and T. A. Bates. The committee was instructed to proceed at once with the investigation, which, when completed, was to be forwarded to the Secretary, who was authorized to have 500 copies of the report printed, and instructed to distribute the same among the members of the Association as soon as possible.

### Election of Jos. R. Thomas to Honorary Membership.

On motion of Mr. E. McMillin, Mr. Jos. R. Thomas was proposed for Honorary Membership in the Association. A standing ballot was ordered and all arose. Mr. Thomas, briefly and with emotion, thanked the Association for the honor thus conferred upon him.

### Election of Officers.

Mr. Smallwood, from Committee on Nomination of Officers, reported two candidates for each position to be filled. A ballot resulted in the following choice.

*President*—E. McMillin.
*Vice-President*—Jos. Light.
*Secretary*—Irvin Butterworth.
*Treasurer*—Jas. A. Raynolds.

The gentlemen elected each made suitable acknowledgment of the honor conferred; Mr. McMillin's remarks being particularly apt and happy. In accordance with the report handed in by the Committee on President's Address (published in our last issue), the Chairman appointed Messrs. Hickenlooper, McMillin, and Bushnell, as a committee to assist the Secretary n preparing a circular embodying the important suggestions contained in the address relative to the formation of a State Bureau.

VOTES OF THANKS.

On motion of Mr. Anderson, a vote of thanks was passed to the retiring board of officers. On motion of Mr. Reinmund, a vote of thanks was tendered to the Association's host, Gen. A. F. Bushnell, of the Springfield Gas Light Company, for the royal manner in which the members had been entertained. In replying to the compliment the General said the members were entirely welcome to his best efforts, to which he then added the remark, "You can best show your appreciation by coming again."

The Convention was then declared adjourned.

## SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

LONDON, June, 10, 1886.

*Modern Gas Purification—Gas and Petroleum, from an Industrial Point of View—The Midland "Gaseries"—The Gas Institute Meetings.*

Some months ago the Corporation of Belfast (Ireland) were sued, as the proprietors of the gas works, by several residents in the neighborhood of the said works, for polluting the atmosphere with noxious vapors; and a verdict was returned against them with nominal damages. Pressure was also brought to bear upon the corporation, by means of deputations appointed at public meetings of residents, etc. In order to satisfy the discontented ones it was decided to call in a first-class gas engineer to examine the works, and report upon the cause of the nuisance, and the best means of abating it. The Council wisely selected Mr. Geo. Wilson Stevenson, C. E., of Westminster, and this gentleman has accordingly visited Belfast for the purpose of making a personal inspection, and in due course presented his report. This document possesses some general interest as including a description of the most approved methods of conducting the operations incidental to purification. Some idea of the magnitude of operations at Belfast may be gathered by the fact that the maximum daily make is nearly four million cubic feet, and the works are divided into two sections. The cause of the nuisance appears to be that lime is used exclusively in the purifiers, and that the purifying plant in section No. 1 is inadequate, being little more than half that provided for No. 2, although each section is intended to deal with a similar quantity, viz., two million cubic feet of gas per day. It is well known that the difficulty of dealing with a small purifying plant, situated in a residential neighborhood, is greatly increased when lime is used. With large purifiers a considerable proportion of the lime may be carbonated before withdrawal, and converted into practically an inodorous substance; but when these do not exist the lime must be renewed whilst yet in the sulphuretted stage, and liable to evolve sulphuretted hydrogen on exposure to air. Mr. Stevenson recommends the use of as little lime as possible—*i. e.*, that oxide of iron should be used for the removal of sulphuretted hydrogen; and, further, in order to reduce the frequency of opening the purifying boxes, that a small percentage of air should be mixed with the gas before it enters the purifiers, for the benefit of the oxide. For the carrying out of this plan a series of eight boxes are required—two for carbonic acid, two for sulphuretted hydrogen, two for sulphur compounds, and two for checks. In connection with the use of air for revivifying the oxide continuously and *in situ*, reference is made to the excellent results secured at Salford by the use of the process patented by Mr. Hawkins, of Wigan. Claus' ammonia process of purification in closed vessels, which consists of admitting gaseous ammonia to mix with the crude gas at the outlet of the condensers, in quantity sufficient to combine with the carbonic acid and sulphuretted hydrogen, is also favorably reviewed, and in view of some experiments now in hand with it, the corporation is advised to wait a few months before undertaking any great expenditure on purifying plant, as the results of the experiments will be known in time to permit of providing for the needs of the next heavy season. Mr. Stevenson also recommends that a third section, of equal producing capacity to those at present existing, should be added to the works; this would comprise 144 double retorts, heated by regenerator furnaces of simple design as used in England.

An industrial paper, published in Belgium, discusses the gas and petroleum industry, respectively, as employers of labor, and comments on the large number of industries concerned in the former as compared with the latter. With regard to gas, in the first place the coal must be mined, and then transported to the gas works; then fire bricks, etc., must be made, and the furnaces erected, and so with other mason work. A large quantity of iron work, purifying materials, gas fittings, etc., is continually in demand; so the gas industry is the means of offering employment to a very large body of men, including coal miners, engineers, brickmakers, gasfitters, meter makers, mainlayers, blacksmiths, railway officials, etc., besides the staff kept at the works. It is estimated that, in Belgium, 3,700 millions cubic feet of gas were made during 1884, being at the rate of 1,840 cubic feet per inhabitant; 1,550 men were employed at the various gas works, and they received about $350,000 as wages. In the raising of the coal, 2,180 miners, etc., were employed, and they received some $400,000 as wages; 500 masons earned some $100,000 between them, and a similar sum was received by gas fitters. When we add an estimate for the engineers, ironworkers, etc., employed in the construction and maintenance of plant, on which a large sum must be spent every year, it is evident that our industry is a large employer of a great many different kinds of labor. Turning to petroleum, it is shown that only an insignificant sum is paid for labor, etc., and the conclusion drawn is that the gas industry should not be taxed, but encouraged in every way; but that if necessary a duty might well be put on petroleum.

A printed paper, giving detailed information respecting the various classes of labor employed in the gas industry would be useful for presentation to discontented consumers, who are apt to fancy that the greater part of the money paid to the gas company goes into the pockets of the shareholders; and also in illustrating the short-sighted policy pursued either by local or State authorities when they seek to tax the gas in any way. Any kind of tax has the effect of increasing the price and limiting the quantity used, and consequently the number of laborers and artizans employed.

An exhibition of gas appliances to which the imposing title of the "Midland Gaseries" has been given, was opened a few days since at Nottingham. The principal feature of the occasion was a good, practical, common-sense address to consumers, by Mr. J. Stott, of London, the maker of a well-known consumer's pressure regulator. Having explained that the meter is a *bona fide* machine that really measures the gas passing through it, Mr. Stott treated of the various kinds of burners in use, including flat flame, Argand, and regenerator, referring, in passing, to a stand in the room, which was filled with samples of so-called economical burners as sold by itinerant venders. The advantages and capabilities of the various heating and cooking stoves in the exhibition were then set forth in detail, and the important subject of the proper size of the distributing pipes in a house, and the trouble so frequently caused by the use of cheap, small piping was clearly explained. It was much the best plan to have pipes of large size, and a good automatic pressure regulator. In conclusion Mr. Stott declared the exhibition open.

Associations seem to be the order of the day, and they are increasing so rapidly that soon we shall find those gas engineers who are determined to keep ahead of the times, engaged upon one or other of these meetings about once a week. Not long since I mentioned the Sulphate Producer's Association, and now there are two more associations in connection with the tar. One is promoted by the tar distillers, who have combined with a view of getting better prices and preventing speculation in regard to the various tar products which they produce. The other, which more intimately concerns gas engineers, is the Tar Producer's Association, formed for the purpose of circulating information respecting contracts, prices, etc., and in other ways endeavoring to secure a better price for their raw product. Perhaps there may be some good to be done by meeting and talking over the price of tar; but, for my part, I think it is possible to overdo "Associations," and prefer to stop at home and burn the tar under the retorts until better prices are offered. What is the use of our "Gas Institute," and of our six district associations, if we are to have distinct associations formed for the purpose of dealing with each "burning" question as it arises? I have always understood that the objects of our "Institute," and of our district associations, were intended to include everything relating to the interests of the gas industry. Really, if associations increase and multiply so rapidly, they will smother each other, fall into disrepute by failing in their respective objects, to a greater or less extent, and the benefits, which are undoubtedly derivable by the use of the association principle in reasonable moderation, will be lost sight of altogether. Gas engineers must have sufficient leisure to attend to their proper sphere of duty.

The twenty-third annual meeting of the Gas Institute, with the exception of one, a by no means unimportant item, the pleasure excursion, is now become a thing of the past. This year the meeting was held in London, and the attendance has been fully maintained. Two notable innovations have been introduced this year, for the first time at a metropolitan meeting. The afternoon sittings have been omitted, so there is now only one sitting, from 10:30 to 2 o'clock, on each day; and the annual banquet has been done away with. The latter has been dwindling for some years past, not that there is any lack of interest or good will amongst the members, but simply from the fact that as the attendance now numbers some 500 strong, it is difficult to get so large a party comfortably accommodated so that all may see the chairman and hear the speeches. So the attendance has been weakened by

the lopping off of parties of twenty or so, who found it more congenial to celebrate the annual banquet by themselves on a small scale. The only differance is, that instead of having one gigantic, dull, heavy, and ceremonious annual dinner, the Institute now has the same social festivity, divided into about twenty different parties, and held at the various hotels patronized by the gas fraternity.

Perhaps one reason why the time of meeting was shortened, was the scarcity of papers. Only ten were promised and of these two were withdrawn leaving eight. Of these, two dealt with tar firing, two with purification, and the others with various interesting questions. The description of the Claus ammonia purification process, which aims at securing the entire purification of gas by liquid treatment in closed vessels, by Mr. Chas. Hunt, of Birmingham, probably possessed the greatest claim to novelty.

I shall not be considered invidious in saying that the chief feature of the meeting was the Presidential address. There are several reasons why a special interest centered in this. The President for this year, Mr. Denny Lane, of Cork, although a regular attendant at the meetings, is not a gas engineer by profession, being the Secretary to the Cork Gas Company. But in the course of papers contributed to the Institute (one on gas engines, by the way, which was read last year, secured the president's medal), and in various speeches, he has exhibited no ordinary oratorial powers, an exact knowledge of natural philosophy, including all modern advancements, and a large share of that ready tact and wit, proverbially attributed to Irishmen, which makes it a pleasure to listen to what he may have to say on any subject. It is no wonder, then, that his address was looked for with more than ordinary interest, and that a large audience assembled to listen to it. Nor were they disappointed. After acknowledging the kindness he had always received from the members of the Institute, Mr. Lane soon made it apparent that he proposed to review the position of the gas industry in relation to physical science. He proceeded to notice recent discoveries in Heat, Light, Electricity, and Chemical Affinity in a style that was easy and graceful (I had almost said poetical), yet at the same time thoroughly solid; giving point to his remarks by means of practical suggestions, such for instance, as the necessity for further research in the matter of the flow of gases through pipes. The address covers a great deal of ground, touching upon almost every detail of gas engneering, and I need scarcely say that it was heartily received and will be accepted as a valuable addition to gas literature. In regard to other business of the meeting we were fortunate in our President. His ready wit and sound common sense contributed in no small degree not only to the proper carrying out of the business but also to the pleasure of the meeting. On a future occasion I hope to notice the papers read.

## ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Annual Election, Quincy (Ill.) Gas Light and Coke Company.—At the annual meeting of the Quincy Gas Company the following gentlemen were chosen to compose a board of directors for the ensuing year: Messrs. C. M. Pomroy, Wm. Steinwedel, R. S. Benneson, H. S. Osborn, A. W. Wells and A. W. Littleton, all of Quincy, with Mr. Alfred Carr, of St. Louis, Mo. At the meeting for organization of the board, Mr. C. M. Pomroy was elected President; Mr. Wm. Steinwedel, Vice-President, and Mr. A. W. Littleton, Secretary and Superintendent. Some time ago we had occasion to say that Brother Littleton would "fill" the Secretary's chair (in every sense) both well and worthily; and it looks as if the executive management of the Quincy Company are determined upon keeping the right man in the right place. The Quincy gas men have every reason to be satisfied with the success that attended the past year's working.

The Easton (Pa.) Municipality Invests in an Electric Lighting Plant.—The Easton muncipal authorities have parted with their senses to such an extent that we presume their return to perfect mental equipoise is most unlikely. Of course, we mean that perfection of mental equilibrium which usually attaches to or prevails in boards of councilmen; and which, in truth, at its best estate closely borders on irrationality at all periods in the "average duration" of the "official life" of a city father. Electric fever symptoms had been shown in the Easton board for quite a while, and the murky weather of the early summer caused the bacteria to develop with great rapidity. Having thoroughly permeated the "frames of the fathers" the result was the germination of a scheme whereby the city agrees to purchase and operate an electric arc lighting plant, with a rated capacity of 60 lamps, wherefrom and wherewith to light the streets. The first cost of the installation is figured up at $18,000; and, if our information is accurate, the gas companies heretofore performed the entire lighting of the city with gas at an annual charge of, say, $4,000. We suppose money is worth 6 per cent. per annum at Easton, and thus we have an initial charge on the investment of $1,080 in the twelvemonth. Pretty good for a beginning. As the municipality will maintain and operate the system it is fair to assume that the taxpayers of the capital seat of Northampton county will be called upon to go down deep in their pockets in order that they may keep up with the times by paying the pipers who sell electric lighting plants. It may, however, be within the pale of possibility that the Easton Gas Company has given cause for just complaint; nevertheless, be the latter so, or not, it is hard for the Council to find justification for their action on such ground. Biting off one's nose in the attempt to spite another portion of the the bitten anatomical structure is poor solace after all; and if the entire truth were told, it might be easy to understand why the Easton Company showed slight disposition to oblige the Easton authorities. The past niggardliness of the latter, in the matter of their dealings with the local gas suppliers—while it may not be put forward as a valid reason for the present absurd lavishness in the new electric lighting scheme—was sufficient to cause little care on the part of the Easton Company whether it ever again furnished gas to a single lamp-post burner in the district.

Cheaper Gas for Little Rock, Arkansas.—Mr. Dean Adams, Secretary of the Pulaski Gas Light Company, of Little Rock, informs us that his Company is in line with the procession which moves steadily on to the goal of cheaper gas. The Little Rock section formed in line on date of June 7th, and it is proposed hereafter to be as near to the band wagon as the nature of the road will permit. The new marching schedule is based on the following "special order" of the officers in command:

| | | | |
|---|---|---|---|
| A monthly consumption | under 5,000 cu. ft..... | $3.00 | per. M. |
| " " | between 5,000 and 10,000 cu. ft... | 2.90 | " |
| " " | between 10,000 and 15,000 cu. ft... | 2.75 | " |
| " " | over 15,000 cubic feet..... | 2.60 | " |

In case accounts are not settled during the first five business days of month, the sum of 25 cents per thousand will be added to the above rates. The figures take effect on all quantities registered from date of first inst. The prior gross charge was $3.75 per thousand, with a scale of discounts (adjusted to quantities consumed) of 5, 10, 15, and 20 per cent. Another new departure instituted by the Company is to the effect that service pipes not over 40 feet in length from main to meter connection will be put in free of charge to the consumer; but where the distance exceeds 40 feet, the excess is to be paid for by the consumer, who will only be charged the actual cost of pipe and for the labor of placing it. Remember that three-dollar gas, or the maximum charge to rule in future at Little Rock, means cheap gas, and the figures as above published show that the Pulaski Company's managers joined the procession "on a run." Much work will be done on the plant this summer, perhaps the most important portion of which is the erection of an 80-foot holder. Messrs. Deily & Fowler, of the Laurel Iron Works, Philadelphia, Pa., have secured the contract for same. A new station meter will also be installed. In fact, when the various improvements are completed the Pulaski Company will be in position, and have every reason, to "point with pride" at a gas works well calculated to meet the demands of those who will draw upon its resources of hidden light. Although in itself a dispeller of shadows and gloom we nevertheless will hope that the shadow of its holders may with great regularity alternate between the large and the less.

Electricity to Light the Streets of Rahway, N. J.—If the Easton, Pa., Councilmanic action in the matter of electric street lighting is open to criticism, it is certain that the Rahway Common Council, or the Lamp and Police Committee thereof, has placed itself in a position sufficiently peculiar to attract the attention of those whose duty it is to indict and bring to trial offenders of the public weal. Close on to a twelvemonth ago the "Tesla Electric Light Company" established a plant in Rahway, but did not succeed in obtaining much business. The affairs of the concern languished badly, and finally its progenitors appreciated the fact that if something were not speedily done to secure a fresh start the enterprise would have to be committed to the tender mercies of the sheriff of Union county. For at least a quarter of a century the Rahway Gas Light Company lighted the streets of the city in a manner quite satisfactory to the taxpayers—both as to quality of illumination, and the price charged for same. When the time of expiration of the '85 contract arrived, the gas folks apprehended no trouble would be experienced in securing an award for '86; but the "Tesla" manipulators, infused by that courage which is the child of despair, were literally fighting for their corporate lives. The annual spring election approached, and shares and promises were slyly and profusely placed in "channels" promising to be of future importance. The voters performed the task of naming and selecting their candidates to occupy seats in the Common Council; and in due time the Council committees were named. Then came the usual call for bids for lighting the city's streets, in response to which propositions were submitted by the Gas Company and the "Tesla" combination. The bids were handed in to the Lamp and Police Committee, and that truly impartial (?) conclave, on the evening of June 15th, reported back to the Council a recommendation that the "Tesla" Company should be awarded the contract; further, that the contract be made to cover a period of two years. Our informant fails to say anything about the number of lamps to be maintained, and also omits to mention the gross charge imposed per annum on the city. The

intimation is given, however, that the "Tesla" folks will receive in the neighborhood of $800 more per annum than the gas company would have received; and a fair estimate of the light to be vouchsafed under the proposed location of the electric lamps makes it appear that the electric service will afford perhaps three-fourths as good an illumination as that which was secured with the number of gas lamps formerly employed. The Council ratified the report of the Committee, and the "Tesla" people may thus count upon two more years of existence. It was hinted above that the Lamp and Police Committee might not have been a thoroughly impartial body; and this is why the hint was thrown out. Perhaps it is purely a coincidence; but of that our readers must judge. The Committee consists of three members, and of these two own the building which houses the "Tesla" plant, while the remaining "impartial" is a member of the "Tesla" Company.

The Candle Power of the Denver (Col.) Electric Street Lights.—The public lighting of Denver is, and has been for some time back, in the hands of the electricians; and these latter have, in their usual vainglorious manner, been loudly boasting over the grand street illumination which they furnish to the inhabitants of that most wonderful city. In fact, the dry air of that famed region, which has done so much toward strengthening the ventricle of the commercial heart of Arapahoe county, appears to have acted directly upon their imaginations—sufficiently inflated before—and now no limit can be placed upon the extravagance of their assertions. We understand the contract with the city calls for the maintenance of 20-candle power incandescent lights, which, it is needless to add, have never been supplied in Denver since the fulfilment of the street lighting contract was entered into by the electricians. Latterly the lights had been most wretched; and, in some instances, a full-fledged glow-worm of the Maryland species could be trusted to outshine the Denver incandescent loop. Repeated requests from the authorities, that the Company improve its lighting service, were met by replies to the effect that the illumination furnished was strictly in accordance with the requirements of the specifications, etc. Going on from bad to worse, the authorities decided upon taking steps to solve the matter, and the solution is appended. The following statements are official, and the facts are incontrovertible:

"*Report of the Chairman of the Committee on Gas and Electric Lighting.* Denver, Col., May 25, 1886.—We respectfully report that, together with the Chairman of like Committee of the Board of Aldermen, and the Mayor, and with the assistance of Prof. Short and others, they have, on two successive nights (May 21st and 22d) made a number of photometrical tests of the candle power of various street lights in different portions of the city. That the lowest candle power of any of the lamps tested was 2.7; that the highest was 18.8 candles; and that the average of all tests was 8.9 candles. These tests were conducted without warning to the Electric Company. Your Committee recommend that the City Council immediately notify the said Electric Company to at once bring their lamps to the 20-candle power stipulated in the contract. C. D. Cobb, Chairman."

It must be understood that the Denver Gas Company was not the party which instigated these examinations; for Mr. Fay, the energetic controller of the gas supply of that city, when on a visit to the East early this spring, assured us no action of the gas company was needed to arouse the authorities of the city to the fact that the light was wretched, if not worthless as a street illuminator. Denver now insists that the electricians only receive pay in proportion to the light furnished; and many of the taxpayers are loud in their assertions that the contract with the suppliers of the light of the future should be abrogated. We once more repeat our advice to gas purveyors that they be not over-anxious to start in the electric lighting business on their own account; and above all we would say beware of the agents who wish to foist upon others the task of operating any single one of the incandescent systems.

Fired by Electric Lighting Wires.—Messrs. Wechsler and Abraham are the proprietors of one of the largest and handsomest structures devoted to the sale of drygoods in the city of Brooklyn, N. Y. They carry an immense and varied assortment of all lines of fine domestic and foreign goods, and employ a brigade of assistants. We believe they operate an isolated arc lighting plant; at any rate electricity illuminates both the inside and outside of their mammoth premises. Possibly, they are now sorry they did not stick to gas; and they would have been sorrier still were it not for the fact, like unto prudent business men, they carry a good line of insurance. However, on the evening of June 21st an alarm of fire brought the department engines to No. 442 Fulton street, and after the firemen had retired Messrs. Wechsler and Abraham had the pleasure of knowing that their electric lighting plant, through a rupture in its insulation, had "isolated" their funds to the extent of $35,000; of this sum $5,000 represents the loss on building; silks, velvets, laces, etc., absorbed the balance.

Cheaper Gas for Jefferson City, La.—Mr. Walton Clark, who is engineer to the Jefferson City Gas Light Company, and who recently experienced the steepness of the staircases which lead up to the offices of the Journal, informs us that his company's managers will make an important reduction in selling rates, to take effect on first of next September. The future net charge will be $2.40 per thousand cubic feet for all gas used for purposes of illumination, while quantities absorbed in cooking and heating stoves, and gas engines, will be assessed at $1.50 per thousand. The prior rates were $3.20 and $2.25, respectively. Mr. Clark is a thorough believer in the soundness and lasting powers of the surprising business boom which now permeates certain of the Southern States. To which we might add that a similar belief is held by many of our Eastern and Western investors.

A Line or Two from Atlanta, Ga.—Brother Wm. Helme, of the Atlanta (Ga.) Gas Light Company, is as true to his reputation as ever; and, paraphrasing Pinckney's historic *defi* of long ago, Helme possesses thousands for defence, although unwilling to pay a cent for tribute. The managers of the Gate City opposition may become convinced of this sooner or later; and the sooner the better—for themselves. In our last mention of Atlanta gas matters we noted that the Gate City (how creaky grow the hinges upon which it swings!) agent had reduced the selling price of his carbonic oxide mixture to fifty cents per thousand—this was on date of January first, '86. The insidious nature of the "strike" was too apparent, and the inhabitants of that particular portion of the 'Cracker State" refused to be beguiled to any great extent. During January, February and March the "Gate" opened to receive perhaps seven per cent. of the total consumers on the books of the Atlanta Company; but as the defection was confined to those who used only small quantities, the shrinkage in the old company's output was but three per cent. In April and May the deserters were few; and up to June 18th only two renounced allegiance to the Atlanta Company. This woeful showing induced the "strikers" to announce, in last fortnight of June, that from and after July 1st the Gate City Company's rate would be readjusted to the net figure of $1 per thousand. To appreciate the "true inwardness" of the above the reader should bear in mind that Mr. Helme's company steadily maintained the $1 per thousand rate. Last winter the old company worked under a disadvantage in that the demand upon its mains was too heavy to permit of the carrying on them of a proper pressure. The heavy consumption season of '86-7 will see this defect provided for, as a contract has been made which provides for the placing of a 12-inch main to run from the present holder location to the new State House building, which is being erected on the division of the city furthest removed from the old Atlanta gas plant.

Brother Denniston once more Declares His Intentions.—Brother W. H. Denniston, Secretary and Superintendent of the East End (Pittsburgh, Pa.,) Gas Company, is "at it again," thus proving his word to be as good as his bond, as he promised his consumers a year or so ago that it rested with themselves when another reduction would be granted. On June 15th he informed the East Enders, whose residences, by-the-way, are pretty far apart, that from and after July 1st the gross selling price would be placed at $1.50 per thousand, settlement of accounts within ten days of presentation securing to the consumer a rebate of ten per cent. Natural gas fears do not cause any interruption to the peaceful slumbers of the genial Secretary of the East End Gas Light Company.

Messrs. Davis & Farnum on the Forward March.—Messrs. Davis & Farnum, of Waltham, Mass., have all sails set, and are booming along over a flood-tide of contracts. Perhaps the most important items on their order-book are the furnace and benchwork constructions at Woonsocket, R. I., and Birmingham, Conn. At the former place they will put in a new stack of three benches of sixes, heated under the new improved Dieterich system. The arrangement will be similar to that instituted at Providence and Pawtucket. At Birmingham, Conn., Mr. C. H. Nettleton has authorized them to erect four benches of sixes in the house of the Derby Gas Light Company. These ovens will be heated under the Farmer-Mooney plan. Despite the fact that Mr. F. J. Davis is kept at it hard and fast, his vim and dash are just as pronounced as ever; but, then, "good wine needs no bush."

Messrs. Connelly & Co. Still "Unlimited."—During the 30 days ended June 15th the above named firm shipped a total of 20,895 bushels of iron sponge, divided amongst 16 different gas companies. Of the large lots the Washington (D. C.) company took 5,000 bushels; the Williamsburgh (N. Y.) company, 5,000 bushels; the old Chicago (Ills.) company, 4,000 bushels, and so on down the list. One lot of 150 bushels went to the Virginia City (Nev.) company. The following governors were shipped in same period: Dallas, Texas, 12-inch; East End, Pittsburgh, Pa., 10-inch; Hazelton, Pa., 6-inch; Mankato, Minn., 6-inch; Putnam Nail Company, Boston, Mass., 8-inch; Sharpsburg, Pa., 6-inch; Waco, Texas, 8-inch; and Yonkers, N. Y. (old company), 12-inch. A big and diversified (as to location) business, beyond doubt.

The Works of the New Citizens Company at Rye, N. Y.—Messrs. Comegys and Lewis have secured the contract for the erection of these works. A water gas process will be employed, and the plant will be adapted to a maximum sendout of 100,000 cubic feet per diem. A 70-foot holder is to furnish the storage room. The Brooksville mains are now in the ground; those in Port Chester are all but finished; and the Rye post road allotment will next be attended to. It is expected to have everything in working readiness by November 15th.

New Holder for the Salem (N. J.) Gas Light Company.—Messrs. Deily & Fowler, Laurel Iron Works, are engaged on the work of putting up a holder, to the order of the Salem Gas Light Company, having a calculated capacity of 35,000 cubic feet. The Salem gas men are preparing themselves to outwit the darkness of next winter. This company has met with wonderful success; but Messrs. Acton and Tyler are shrewd business men. They are always to be found in line with the policy of good service at fair prices.

An Odd Street Lighting Contract.—According to the Brooklyn *Daily Union*, the Improvement Commissioners of New Lots (soon to become a parcel of Brooklyn city), L. I., recently made a seven years' contract with the Union Gas Light Company, based on the following plan: The town is to maintain 800 lamps, with initial charge for each per annum fixed at $25. When the output of gas reaches 300,000 cubic feet per day (at the present selling price of $2.50 per M.) the price of each lamp is to be reduced to $22.50; when it reaches 350,000 cubic feet, $20; 500,000 cu. ft., $18. When the sendout to ordinary consumers aggregates 300,000 cu. ft. per day the selling price will be lowered to $2.25 per M.; and when the ordinary sendout is found to be 500,000 cu. ft. per day, a selling rate of $2 per M. will go into effect.

A Word from Memphis, Tenn.—It now looks as if President Jones, of the Memphis Gas Light Company, will beat the Equitable stock-jobbers who have been attempting to capture the Common Council of that city. Perhaps our Memphis friends could be prevailed upon to furnish us with the "inside history" of the Equitable's tactics. We would be glad to publish it.

## Notes from the West.

By Retort.

A new departure in illuminating by the electric light has made its appearance at Vincennes, Ind., where the city authorities have just closed a five years' contract with a local company to furnish 100 thirty-candle power incandescent lamps to light the streets now outside of the gas district. A lamp will be placed at each intersecting street, and 11 miles of wire will be taken up in the circuit.. They are to be lighted under a moon table, and the city pays $24 per year per light. The system is known as the Heisler.

The directors of the Minneapolis (Minn.) Exposition have about decided on illuminating their principal thoroughfares, when their great exhibition is opened, by a series of gas jets fed from pipes located in the street curbs. The idea is an admirable one. The illumination of St. Louis by this method during the annual "Veiled Prophets'" week is something unsurpassed by anything of the sort in the world. It is not expensive, for the gas pipe used can be stowed away and made use of for a long series of years; and a city gas company can scarcely refuse, if not to contribute the gas, at least to furnish it at less than cost price. The effect is something of which those who have never seen the spectacle can hardly conceive. All colors are reproduced in the small glass globes put over the jets, and all sorts of figures are made in street arches and upon the sides of buildings, to which the flow of gas may cheaply be diverted.. Minneapolis may be wise in adopting Mr. Reagan's proposition.

The Kansas City (Mo.) fracas, of which I wrote in my last, has given the St. Louis gas kaleidoscope a turn, and the fight between the Laclede and its antagonists has become a bitter competition. This latter has reached the point where the water gas people resort to the old scheme of giving a "chromo" to each new consumer who deserts the Laclede. This time the chromo consists of a gas stove. The Laclede has given it out (unofficially) that it would not meet that way of securing patrons, and continues to charge for its stoves. Consumers in the Laclede district seem disappointed with the warfare waged by the water gas folks. It has been generally supposed that the Trust would begin to cut right and left on the prices of gas to force the Laclede into the agreement; but now it is claimed that the aggressive contestant has been so weakened by its expensive fight here, and by its expensive and disastrous contest in Kansas City, that it will not try to push the Laclede except by such methods as those already begun. This will take the Laclede out of the defensive and put it into the aggressive with the Trust and the water gas people at the disadvantage which the Laclede was expected to occupy. Since discovering the weakness of the Laclede opponents the street will not be surprised if John J. Mitchell, the ruling Director, makes an early move to bring on a fight. Mr. Mitchell, as the ruling spirit, will spend a great deal to hold his own. He has lived an energetic and economical life, and is now worth about $2,000,000—being able to buy the Laclede and pay cash for it. He made all of this himself, and has been through very severe fights, particularly in the railroad and steamboat business; having the reputation of never giving up, even when appearances indicate that he is whipped. With him opposing the Eastern and St. Louis syndicate, the street looks for some exciting work, and to see the Laclede come out as winner, with the power to dictate terms.

In the meantime Chicago, Ills., seems to have become restless under the greater activity in gas circles at St. Louis, and has about concluded to outdo all former gas wars. An ocean of war paint has been "laid on," and the tocsin is loudly sounding. The rallying cry seems to be, "Anything to beat old Watkins." Mr. Billings, President of the Peoples Company, shied his castor into the ring by serving notice on Mr. Watkins, President of the South Side Company, that he should commence in the Superior Court this week a suit against his company for $1,500,000 damages for invasion of the West Side. Mr. Watkins's offense is that his company has begun the construction of a tunnel under Taylor street, and has made over three thousand contracts on the West Side to furnish gas at one dollar per thousand cubic feet.

The belligerents seem to be Mr. Billings, Sidney Kent, Columbus R. Cummmings (of Nickel Plate Railroad fame), and others, who expect to reap large harvests by wrecking the present vested interests, and on the ruins thereof to build a "consolidated" with immense quantities of "ground floor" stock. This policy is foreshadowed by Mr. Billings, who says, in reply to the question—

"What will be the outcome of the gas war?"

"Gas will go down until there is no profit in it. Stockholders in various companies will see their money disappear without hope of return, and will refuse to put up more cash. Then they will call a halt on the war, and demand a consolidation of all the companies. Consolidation will be the ultimate end of the strife."

## Magnesia in Portland Cement.

For a long time magnesia has been supposed to have a bad influence when present in cements, and M. Lechartier has been investigating the nature and cause of its action in structures built with cement, such as basins, dams, and retaining walls, either exposed to air or water. These structures were built by competent engineers in different localities. The cements used did not contain sulphate of lime in harmful proportion, they had a proper density, and were made of good sands. Nevertheless, in all cases the effects were the same, and a slow destruction of the cement went on with time. The explanation of the facts arrived at by M. Lechartier is that the cements employed were really mixtures of Portland cement with magnesia, which behaved at first as an inert substance; but little by little the magnesia became hydrated, producing expansion of the mortar and the deterioration of the works. St. Clair Deville has shown that pure magnesia without admixture of silica and alumina can combine with water to form a hydrate of great hardness, but the formation is accompanied with increase of volume. Portland cement alone contains but a small proportion of magnesia. M. Lechartier further observes that the increase of volume of the mortars takes place more rapidly when the water gains access more readily to the mass. Hence the basins of fountains, reservoir walls, and so on, are affected in a comparatively short time.

## Thermometers for White Heat.

Messrs. Heisch and Folkard have devised some new thermometers with platinum or porcelain bulbs, by which very high temperatures, even those of a white heat, can be measured without having to resort to an expensive or troublesome pyrometer. The reading is taken in precisely the same way as at present with an ordinary thermometer, but the result is obtained by the pressure of air inclosed in the bulb which is exposed to the heat. This pressure acts directly on a vertical column of mercury. The bulb is hermetically sealed, and the instrument is unaffected by changes in the height of the barometer.

## It is a Fact.

That the Washington (D. C.) Gas Light Company has a fund (it now amounts to several hundred dollars) which is the result of moneys received from unknown persons who have sought to ease their consciences by remitting to the company certain sums wrongfully withheld in the past by them from its exchequer. The latest "remittance" was made a week or so ago, by an anonymous contributor who forwarded $60.

## The Market for Gas Securities.

The Gas Consumer's Association lawyers do not appear to have received much comfort at the hands of Attorney General O'Brien on date of June 22d, when the former named worthies, as tools of their monopoly-hating (?) principals, argued that the Consolidated Company's charter should be annulled. In any event the Consolidated shares have shown considerable strength, and it is quite likely that the "shorts" below 75 will suffer for their temerity. At time of writing (afternoon June 30) 77½ is bid, sellers holding out for 78. The *Daily Indicator*, of June 28, quotes President Smith as saying that the actual transfer of shares on the books of the Consolidated Company has been very limited, while, according to the dealings on the Exchange, the capital stock of the company "has been sold over 30 times since April 1st." This shows how the cat jumps. Consolidated is to-day a purchase for investment. Brooklyn shares, save Fulton Municipal, are dull; but the exceptional strength displayed by the latter is accounted for by some on the ground that a stock deal is soon to take place. The company pays its regular quarterly dividend of 3 per cent. on July 10th. Newark (N. J.) shares are strong. Old Louisville (Ky.) stock has made a sharp advance. It is said the gas war at that point is ended. At auction: 100 Mutual, city, at 111-112½; 25, Equitable, city, at 120½; $2,000 bonds, Equitable, Chicago, at 97½. Eastern gas shares are all firmly held, particularly so in the case of old Boston, as also New Haven. We note a decided improvement in San Francisco gas securities; and despite the efforts of the Senatorial inquisitors, Washington (D. C.) gas keeps along in the even tenor of its way.

## Gas Stocks.

**Quotations by Geo. W. Close, Broker and Dealer in Gas Stocks,**

16 Wall St., New York City.

July 2.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

| | Capital. | Par. | Bid | Asked |
|---|---|---|---|---|
| Consolidated | $35,430,000 | 100 | 78 | 78½ |
| Central | 440,000 | 50 | — | — |
| " Scrip | 220,000 | — | 47 | 57 |
| Equitable | 2,000,000 | 100 | 120 | 123 |
| " New Stock | | | 150 | 155 |
| " Bonds | 1,000,000 | — | 113 | 115 |
| Harlem, Bonds | 170,000 | — | — | — |
| Metropolitan, Bonds | 658,000 | — | 113 | — |
| Mutual | 3,500,000 | 100 | 111 | 113 |
| " Bonds | 1,500,000 | 1000 | 104 | 107 |
| Municipal, Bonds | 750,000 | | — | — |
| Northern | 125,000 | 50 | — | — |
| " Scrip | 108,000 | | | |
| Yonkers | | 50 | 51 | 55 |
| Richmond Co., S. I. | 300,000 | 50 | 60 | — |
| " Bonds | 40,000 | — | — | — |
| Gas Co's of Brooklyn. | | | | |
| Brooklyn | 2,000,000 | 25 | 111 | 113 |
| Citizens | 1,200,000 | 20 | 73x | — |
| " S. F. Bonds | 320,000 | 1000 | 106 | 110 |
| Fulton Municipal | 3,000,000 | 100 | 153 | 155 |
| " Bonds | 300,000 | | 104 | 108 |
| Peoples | 1,000,000 | 10 | 71x | — |
| " Bonds | 290,000 | — | 106 | 107 |
| " " | 250,000 | — | 103 | — |
| Metropolitan | 1,000,000 | 100 | 87x | 89 |
| Nassau | 1,000,000 | 25 | 117x | — |
| " Ctfs | 700,000 | 1000 | 101 | 102 |
| Williamsburgh | 1,000,000 | 50 | 139x | — |
| " Bonds | 1,000,000 | — | 112 | 114 |
| Out of Town Gas Companies. | | | | |
| Buffalo Mutual, N. Y. | 750,000 | 100 | 85 | 90 |
| " Bonds | 200,000 | 1000 | 95 | 100 |
| Citizens, Newark | 918,000 | 50 | 130 | 140 |
| " " Bonds. | 124,000 | — | 105 | 110 |
| Chicago Gas Co., Ills | 5,000,0000 | 25 | 128 | 135 |
| Peoples G. L. & C. Co., Chicago, Ills | 3,000,000 | | 8 | 12 |
| Cincinnati G. & C. Co. | | | 184 | 187 |
| Consolidated, Balt. | 6,000,000 | 100 | 50½ | 51 |
| " Bonds | 3,600,000 | | 107 | 107½ |
| Chesapeake, Balt. | 1,500,000 | 100 | 73 | 75 |
| " | 1,000,000 | | 100 | 102 |
| Central, S. F., Cal. | | | 67 | — |
| Capital, Sacramento, Cal. | | | 55 | 58 |
| Hartford, Conn. | 750,000 | 25 | 140 | 142 |
| Jersey City | 750,000 | 20 | 155 | 160 |
| Laclede, St. Louis, Mo. | 1,600,000 | 100 | 92 | 97 |
| Louisville, Ky. | 1,500,000 | 50 | 115 | 120 |
| Montreal, Canada | 2,000,000 | 100 | 181 | 182½ |
| New Haven, Conn. | | 25 | 190 | 195 |
| Oakland, Cal. | | | — | 34 |
| Peoples, Jersey City | | — | 25 | 30 |
| " " Bonds. | | | — | — |
| Paterson, N. J. | | 25 | 90 | — |
| Rochester, N. Y. | | 50 | 75 | 80 |
| St. Louis, Missouri | 600,000 | 50 | — | 500 |
| San Francisco Gas Co. San Francisco, Cal. | 10,000,000 | 100 | 60 | 61 |
| Memphis (Tenn.) Gas | 750,000 | 100 | 78 | 80 |
| " Bonds. | 240,000 | 100 | 103 | — |
| Washington, D. C. | 2,000,000 | 20 | 212½ | — |
| Wilmington, Del. | | 50 | 199 | 210 |
| Havana (Cuba) Gas Co. | 3,000,000 | 100 | 8 | — |
| " Bonds | 550,000 | | | |

## Advertisers Index.


**GAS ENGINEERS.** Page

Jos. R. Thomas, New York City 24
Wm. Henry White, New York City 24
Wm. Farmer, New York City 24

**GAS WORKS APPARATUS AND CONSTRUCTION.**

James R. Floyd, New York City 27
T. F. Rowland, Greenpoint, L. I. 27
Delly & Fowler, Phila., Pa. 27
Kerr Murray Mfg. Co., Fort Wayne, Ind. 27
Stacey Mfg. Co., Cincinnati, Ohio 27
Bartlett, Hayward & Co., Baltimore, Md. 27
Morris, Tasker & Co., Limited, Phila., Pa. 26
Davis & Farnum Mfg. Co., Waltham, Mass 26
Tanner & Delaney Engine Co, Richmond, Va. 26
R. D. Wood & Co., Phila., Pa. 26
Southwark Foundry and Machine Co., Philadelphia, Pa. 26

**PROCESSES.**

National Gas Light and Fuel Co., Chicago, Ills 18
Henry C. Rew, Chicago, Ills. 17

**GAS AND WATER PIPES.**

Gloucester Iron Works, Phila., Pa. 24
Warren Foundry and Machine Co., Phillipsburgh, N. J. 24
Mellert Foundry and Machine Co., Reading, Pa. 24
Cincinnati and Newport Iron and Pipe Co., Newport, Ky. 24
John Fox, New York City 24
Ohio Pipe Co., Columbus, Ohio 24
Pancoast & Rogers, New York City 24
M. J. Drummond, New York City 24

**GAS ENGINES.**

Schleicher, Schumm & Co., Phila., Pa. 376
Clerk Gas Engine Co, Phila., Pa. 20

**RETORTS AND FIRE BRICK.**

J. H. Gautier & Co., Jersey City, N. J. 22
B. Kreischer & Sons, New York City 22
Adam Weber, New York City 22
Laclede Fire Brick Works, St. Louis, Mo. 22
Brooklyn Retort and Fire Brick Works, Brooklyn, N. Y. 22
Borgner & O'Brien, Phila., Pa. 22
James Gardner, jr., Pittsburgh, Pa. 22
Henry Maurer, New York city 22
Chicago Retort and Fire Brick Works, Chicago, Ills. 22
Baltimore Retort and Fire Brick Co., Baltimore 22
Standard Gas Retort and Fire Brick Co., Ironton, Ohio. 22
Oakhill Gas Retort and Fire Brick Co., St. Louis, Mo. 22
Evens & Howard, St. Louis, Mo. 23
Cincinnati Gas Retort and Fire Brick Works, Cincinnati, O. 23
Emil Lenz, New York City 23

**SCRUBBERS AND CONDENSERS.**

G. Shepard Page, New York City 25

**REGENERATIVE FURNACES.**

Adam Weber, New York City 18
Bartlett, Hayward & Co., Baltimore, Md 16

**GAS GOVERNORS.**

Connelly & Co., New York City 363
T. C. Hopper, Phila., Pa 17

**CEMENTS.**

C. L. Gerould, Manchester, N. H. 16
Pecora Paint Co., Phila., Pa. 18
Emil Lenz, New York City 16
Howard Fleming, New York City 16

**GAS ENRICHERS.**

Forest City Naptha Co., Cleveland, Ohio 18
W. H. H. Childs, New York City 16

**GAS METERS.**

Harris, Griffin & Co., Phila., Pa. 30
American Meter Co., New York and Philadelphia 31
The Goodwin Gas Stove and Meter Co., Philadelphia, Pa. 31
Helme & McIlhenny, Phila., Pa. 31
Maryland Meter and Mfg. Co., Baltimore, Md. 30
D. McDonald & Co. Albany, N. Y. 31
Nathaniel Tufts, Boston, Mass. 30

**EXHAUSTERS.**

P. H. & F. M. Roots, Connersville, Ind. 2
Smith & Sayre Manufacturing Co., New York City. 26
Wilbraham Bros., Philadelphia, Pa. 28
Connelly & Co., New York City 16

**GAS COALS.**

Penn Gas Coal Co., Phila., Pa. 29
Perkins & Co., New York City 28
Newburgh Orrel Coal Co., Baltimore Md 29
Despard Coal Co., Baltimore, Md. 29
Chesapeake and Ohio R.R. Coal Agency, N. Y. City. 29
Westmoreland Coal Company, Phila., Pa. 29
Monongahela & Peters Creek Gas Coal Co., Pittsburgh, Pa. 29

**VALVES.**

Ludlow Valve Manufacturing Co., Troy, N. Y. 16
John McLean, New York City 16
Fairbanks & Co., New York City 16

**GAS LAMPS.**

The Siemens-Lungren Co., Philadelphia, Pa. 25
G. Shepard Page, New York City 17
Albo-Carbon Light Co., Newark, N. J. 17

**PURIFIER SCREENS.**

John Cabot, New York City 360

**GAS STOVES.**

American Meter Co., New York and Philadelphia 21
The Goodwin Gas Stove and Meter Co., Phila. Pa. 32

**STREET LAMPS.**

J. G. Miner, Morrisania, New York City 359
Bartlett Street Lamp Mf'g Co., New York City 23

**BURNERS.**

G. Gefrorer, Phila., Pa. 17
G. Taylor, New York City 17

**PURIFYING MATERIAL.**

Connelly & Co., New York City 19

**STEAM BLOWER FOR BURNING BREESE.**

H. E. Parson, New York City 361

**GAS FIXTURES.**

Mitchell, Vance & Co., New York City. 16

**STEAM PUMPS.**

A. S. Cameron Steam Pump Works, N Y. City 23

**STEAM ENGINES.**

Westinghouse Machine Co., Pittsburgh, Pa. 29

**COKE CRUSHER.**

C. M. Keller, Columbus, Ind. 18
B. J. Allen, Newark, New Jersey 16

**GAS BAGS.**

Peerless Manufacturing Company, New York City. 16

**COAL HANDLING MACHINERY.**

C. W. Hunt Company, New York City 16
Stuebner & Woods, Long Island City, N. Y. 16



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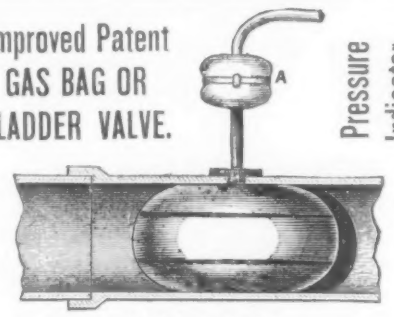


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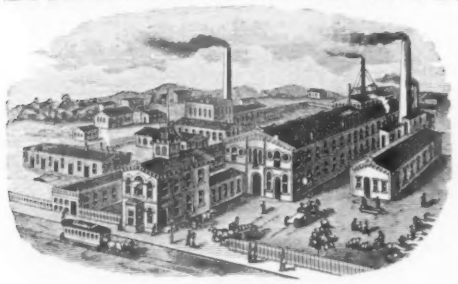

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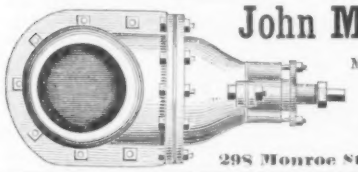

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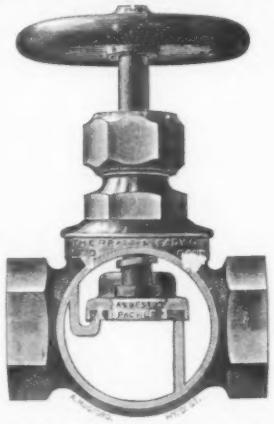

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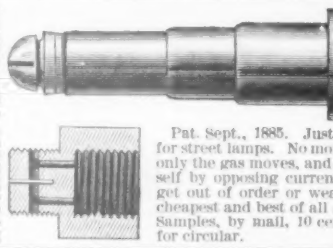

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**MAKES A BETTER JOINT THAN RED LEAD.**

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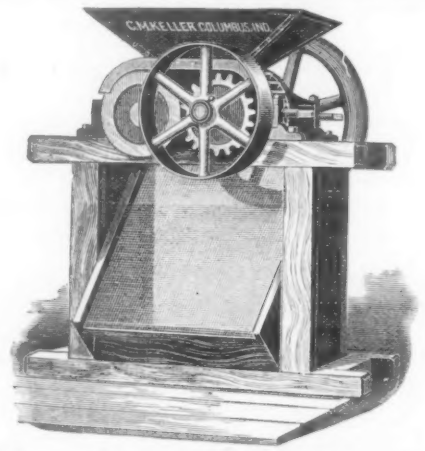


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**Builders, Lessees, and Purchasers of**

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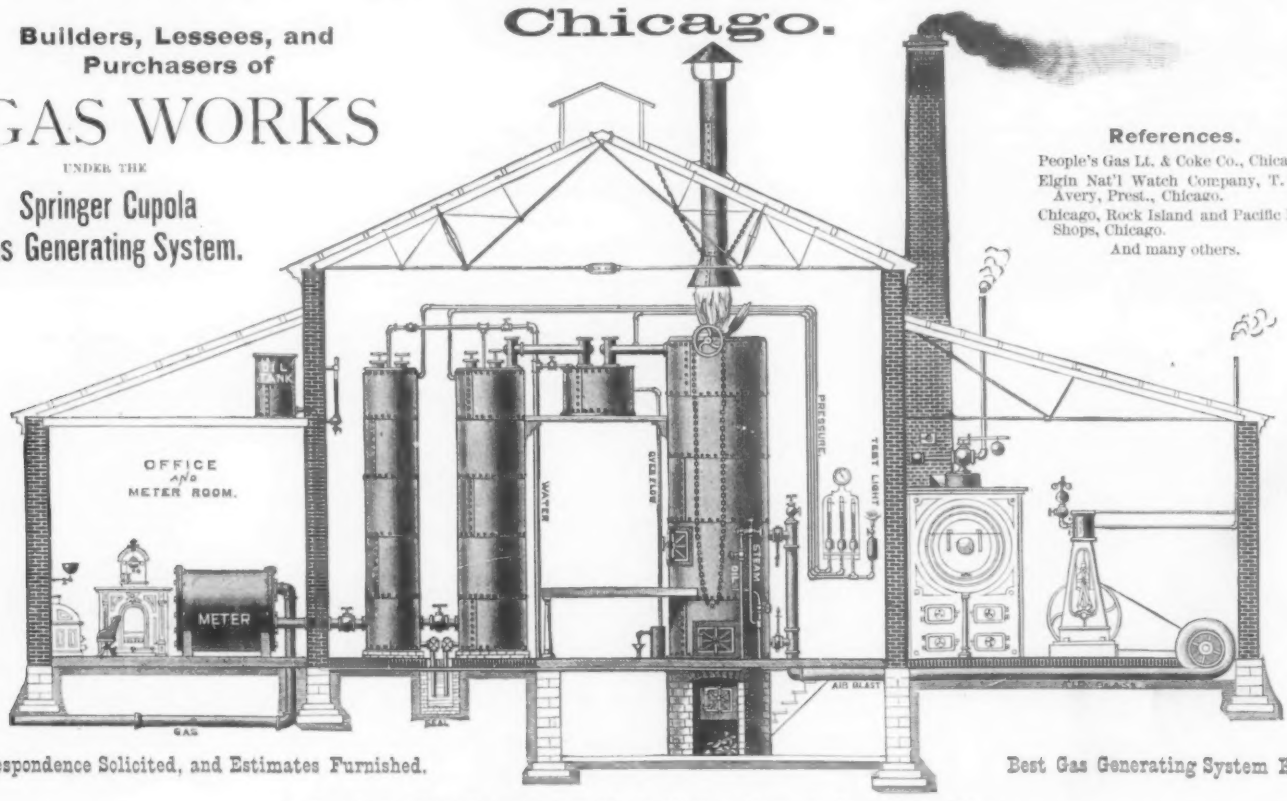


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Iron Sponge is now used by *over three hundred gas companies* in the United States, and is recognised as the *most efficient* and *economical* form of iron ever used for the purification of gas. Many persons confound "Iron Sponge" with the ordinary preparations of oxide, and call any nondescript mixture of iron turnings, etc., "Iron Sponge."

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CHICAGO, ILL.—Your Iron Sponge for gas purification has been used at the south station of this company during the past five years, and the results have been so satisfactory that we are now about to use it at the north station as well.
THEOBALD FORSTALL, Vice President.

COLUMBUS, O.—In reply to your letter of the 19th inst., I have used oxide of iron for purifying coal gas almost to the exclusion of other material during the past 18 years. The results have always been satisfactory respecting the complete elimination of sulphuretted hydrogen from the gas; and respecting cost of material and labor, I would say that the oxide of iron process of purification will cost not to exceed 25 per cent. of the cost of hydrate of lime purification. I regard the *Connelly Iron Sponge as the best form of oxide of iron* of which I have any knowledge.
E. McMILLIN, Engineer and General Manager.

CHARLESTON, S. C.—In answer to yours of the 16th inst., we would say that the thousand bushels of Sponge purchased from you in 1884 has been in constant use, and has had passed through it 105,000,000 cubic feet to date, and we are still using it. Owing to the *smallness* of our purifying surface, it has been rather hard worked. We will need a new supply soon. THOMAS TURNER, President.

FITCHBURG, MASS.—As I am changing the Iron Sponge bought of you over six years since for some new Sponge, and thinking you would be interested to know the results, would state the old lot of Sponge purified 67,561,800 feet of coal gas, or 180,000 feet to a bushel. H. F. COGGSHALL, Manager.

MACON, GA.—Your inquiry as to how I am pleased with the Iron Sponge after continued use has just reached me. I am free to say that after five years' use of Sponge I find no reason to change my first favorable impressions regarding it.
A. E. BOARDMAN, Supt. Gas and Water Works.

SANDUSKY, O.—In answer to inquiry regarding Iron Sponge, would say that we have used your material continually since April, 1884, and, with the exception of adding a little coarse sawdust to lighten it up, have used same material without further expense, and expect to do so for some time to come. *It has been a great advantage and saving to us over old method.* THOMAS WOOD, Supt.

CEDAR RAPIDS, IOWA.—We have been using your Iron Sponge for the past seven years with the *best of satisfaction*, and the cost of purification has not been *one-fourth the cost* while using lime. A. T. AVERILL, Prest.

ELGIN, ILL.—Replying to your inquiry as to satisfaction given by your Iron Sponge, will say we have used your purifying material for the past year with the best of results, and *perfect satisfaction as to economy, convenience, and quality of gas produced.*
M. H. THOMPSON, Sec. and Treas.

NORRISTOWN, PA.—For the purification of our water gas at the "Novelties" Exhibition, held in this city last October, we used your Iron Sponge with complete satisfaction. I believe it to be the best material for the purification of all gases containing large amounts of sulphur, and would recommend it as the most economical, and giving the least trouble, of any material I ever used. LOWE MFG. CO., by T. S. C. LOWE, Prest.

PITTSFIELD, MASS.—This company has used your Iron Sponge in the purification of coal gas for the last six years. We have used it because it was *much less expensive than lime*; and the reports of the State Gas Inspector show the gas made by this company to be fully up to the requirements of the law in freedom from sulphur and ammonia.
WM. R. PLUNKETT, Treas. Pittsfield Coal Gas Co.

LAWRENCE, MASS.—In answer to yours of the 16th inst., I would say we have used your Sponge at these works for several years, and are perfectly satisfied with the results obtained from it. C. J. R. HUMPHREYS, Agent.

EAST CAMBRIDGE, MASS.—We commenced the use of your Iron Sponge in March, 1885. In November and December we purified 11,000 feet per bushel. We have now passed 70,000,000 feet through the Sponge, and as yet it shows no indication of losing its efficiency. *Our saving on the labor account for the past 9 months is nearly* $500. H. A. ALLYN, Supt.

CADIZ, O.—We have been using your Sponge for five years with entire satisfaction, and at about *one-fourth the former cost* when we used lime for purification.
A. N. HAMMOND, Supt. Cadiz Gas Light Co.

SHARON, PA.—I have used your Iron Sponge for several years with very satisfactory results. It improves on acquaintance. It has proved *effective, economical, and cleanly* to work with. D. R. SHIRAS, Sec.

LOGAN, O.—In reply to yours of the 16th inst., we have been using the first lot of Iron Sponge received from you in August, 1884, constantly, and it is still in good condition, and, as far as I can judge, likely to last as long again. We have no desire to go back to purification by lime. A. MICHIE, Sec.

COLUMBUS, IND.—In reply to yours of the 16th, would say that we have been using Iron Sponge for two and a half years, and are perfectly pleased with it—it being *much cheaper than lime* and just as good. C. M. KELLER, Sec.

WILKES-BARRE, PA.—In reply to yours of the 18th, will say I commenced using your Iron Sponge October, 1885, and *prefer it to lime.* Do not have to change the boxes so often, and the back pressure is very much decreased. *I can recommend it for purification of water gas.* MARCUS SMITH, Supt.

LONG ISLAND CITY, N. Y.—The carload of Iron Sponge arrived in good condition. When ordering the trial lot I was a little in doubt as to the benefits to be derived from it in the purification of water gas. I have now abandoned lime as a means of purification, for the reason that on all accounts *the Sponge is preferable*, the labor and cost of material being largely reduced, and the comforts correspondingly increased. Instead of using sawdust, as directed by your circular, I put one tray at bottom six inches deep of old spent lime, and have allowed it to remain sixty days. It absorbs any oily matter that is carried mechanically past our condenser. C. A. KITTLE, General Manager.

HYDE PARK, ILLS.—We have used your Iron Sponge in our works since November last, and have found it very satisfactory. GEO. C. WILSON, Prest.

LOGANSPORT, IND.—In answer to yours of 16th, would say we have been using your Iron Sponge *for five years with very satisfactory results.*
LOGANSPORT GAS LT. AND COKE CO., E. S. RICE, General Manager.

SANTA ROSA, CAL.—We have been using Iron Sponge since August, 1881, and are *perfectly satisfied* with the results derived from its use as a purifying material.
E. A. SHACKELFORD, Supt.

MILWAUKEE, WIS.—We have had your Iron Sponge in use for the past three months, and prefer it to any other purifying material we have ever used.
ED. G. COWDERY, Supt.

PAINESVILLE, O.—We have used your Iron Sponge for the past two years, and shall continue to use it. *It gives perfect satisfaction.*
J. W. ALEXANDER, Prest. and Manager.

COVINGTON, KY.—Replying to yours of the 28th, I would say that we have been using your Iron Sponge for six years. The last lot purchased of you three years ago is still in use and giving good satisfaction. You could not induce us to return to the use of lime. RICHARD SALTER, Supt.

WOOSTER, O.—We have used your Iron Sponge about eight months with entire satisfaction, and shall continue to use it as long as we can do so with the success we have had thus far. WOOSTER GAS LIGHT CO.

KENOSHA, WIS.—It gives us pleasure to add one more testimonial to the value of your Iron Sponge, received at first with some distrust, but now so far overcome as to make *its use indispensable*—the rule instead of the exception. J. H. KIMBALL, Prest.

NEWARK, N. J.—For more than a year past we have used your Iron Sponge, and regard it a very excellent and economical purifier. We are now using no other material for purifying our gas. A. A. SMALLEY, Prest. Citizens Gas Light Co.

QUINCY, MASS.—We most cheerfully and heartily recommend your Iron Sponge as being the best purifier of gas we have ever used or heard of. We purchased a supply over three years ago, and have used it constantly ever since to our entire satisfaction. Although our works are comparatively small, our saving during that time has amounted to thousands of dollars—a fact which in itself speaks volumes of praise.
N. J. McNEIL, Supt.

OHIO PENITENTIARY.—In reply to yours of the 28th inst., I take pleasure in saying that the Iron Sponge bought of you two years ago, and which has been in constant use ever since, has given entire satisfaction. It does all you claim for it; in fact it reduces the cost of purification to almost nothing—which certainly ought to be satisfactory. R. P. GREEN, Supt.

MURFREESBORO, TENN.—I have been using your Iron Sponge since Oct. 1, 1884, and am well convinced that it is *a good and efficient purifying material.* It is much cleaner to handle and costs less than lime. CARROLL COLLINS.

ATHENS, GA.—Replying to your favor of the 28th inst., we have been using Iron Sponge for a year and a half, at first rather suspiciously, but latterly to the complete exclusion of lime—so thoroughly satisfactory has the cleaner purifier proved itself. It is equally as effective as lime, and at the same time makes a neat purifier room possible.
C. D. FLANIGEN, Agent.

NORTH ATTLEBORO, MASS.—Replying to your letter of Jan. 28th, would say that we commenced using your Iron Sponge April 14, 1884, from which time to the present, with the assistance of one lime purifier, we have purified on an average of 7,000 cubic feet per bushel. I am very much pleased; for besides reducing the cost of purification about one-half, it removes effectually what we have previously been unable to take care of at our works—*ammonia.* E. G. PRATT, Supt.

RACINE, WIS.—Yours of the 28th to hand. I commenced to use your Iron Sponge in November, 1882. We purified 3,000 feet to the bushel the first month. May, July, and September of same year we purified 20,212, 17,462, and 23,937 cubic feet per bushel respectively. Our average for 1883 was 15,613 feet per bushel; and for 1884 was 9,058 feet per bushel. In May, 1885, we threw away the old Sponge and started on 480 bushels of new Sponge. Our average purification for 1885 was 5,478 cubic feet per bushel. We estimate that it costs us half a cent per 1,000 feet (including labor) for purification with Sponge.
JOHN RODGERS, Supt.

LIMA, O.—We have used your Iron Sponge for two years—nothing else—and are entirely satisfied with it. LIMA GAS LIGHT CO.

PORTSMOUTH, O.—Yours of 16th to hand. In reply would state that we have been using your Iron Sponge since April 1st, 1884, and so far *it has given entire satisfaction*; and we have had no occasion to renew since first using the same.
J. WARREN SMITH, Sec.

LYNN, MASS.—In reply to yours of Jan. 16th, would say that we have used your Iron Sponge for a number of years with *economical results.*
CHAS. F. PRICHARD, Supt.

NEW CASTLE, PA.—We have been using Iron Sponge for eight years, with good results—giving us entire satisfaction. We are still using the last lot we got in 1883.
LAWRENCE GAS CO.

MANSFIELD, O.—Our company has been using your Iron Sponge for two years in our works for purifying, and it has been very satisfactory. We would not know how to get along without its use. G. S. HARRIS, Supt.

HAMILTON, O.—We have been using your Iron Sponge for the past five years exclusively, using no lime with it; and it affords us pleasure to testify to its merits. Our present lot has been in use now over 16 months. D. H. HENSLEY, Sec.

WATERTOWN, N. Y.—Yours of Jan. 16th just received, and in answer would state that we have used Iron Sponge exclusively since the last of April, 1882, and are *entirely satisfied* with it. Our gas is well purified, the labor is very much less than with lime, and our candle power averages 18, using coal alone. JOS. S. GREEN, Sec.

EUFAULA, ALA.—We have been using your Iron Sponge for some months. It gives us satisfaction in purifying gas, and is decidedly cheaper than any other process we have used. JOHN W. TULLIS, Prest.

GAS ENGINES. GAS ENGINES. GAS ENGINES.

# THE CLERK GAS ENGINE.

The following advertisement appears in this and other papers:

**THE "OTTO" GAS ENGINE.**

Guaranteed to consume 25 to 75 per cent. less gas than any other gas engine per brake horse power.

There also appeared in the New York *World* of September 20th, 1885, the following modest challenge:

**THE "OTTO" GAS ENGINE**

Is guaranteed to consume from 30 to 75 per cent. less gas per brake horse power than any other gas engine. I propose to enter the "Otto" for competition at the coming American Institute Exhibition, and invite other gas engine builders then and there to disprove the claim made for the "Otto" engine, if they can. A.C. MANNING, 47 Dey st.

The Clerk Gas Engine Company immediately accepted this challenge, selecting for the test a No. 3 Engine from the stock on hand, every part of which was of their own manufacture, in Philadelphia.

The Superintendent of the Institute issued the following regulations to govern the Judges in their tests:

### Programme of the Gas Engine Tests.

"The exhibitors shall furnish a description of their engine, giving weight, price, claimed horse power, and such information as the Judges may require.

"The exhibitors shall each furnish a friction brake and a proper and complete indicator attachment (the indicators to be used to be furnished by the Institute.)

"The test will last six hours for each engine at full power, and will bear upon the economy as well as the power of the engine—both as regards the actual and effective power.

"Exhibitors are requested to make preparation for the test immediately.

"If any exhibitor should take any exception to any act of the Judges during the test, they are requested to enter their protest in writing within twenty-four hours of the time of said test."

The Judges changed the duration of the test for each engine to two hours.

### The Judges' Report upon the Test Between the "Otto" and Clerk Gas Engines, at the 54th Fair of the American Institute, December, 1885.

The undersigned Judges report that after the tests made with the Clerk and Otto Engines, which were conducted as carefully as possible under the existing conditions, the results as regards consumption of gas were practically identical—*the difference being only one-fifth of a cubic foot per effective horse power per hour.* Outside of this we find very commendable features in both engines—ESPECIALLY IN THE CLERK; but in view of the paramount importance of the item of consumption of fuel in Gas Engines, we do not feel justified in deciding upon the relative merits of both engines solely upon points of design and workmanship, and therefore we would recommend a more thorough and longer test, which will bring out the difference in economy, if any, or prove beyond question the equal standing of the two engines on that score; in which latter case it would become proper to base a decision on other points. The tabulated record of the tests is hereto appended.

*A true copy of the report on file,* JOHN W. CHAMBERS, Sec.

WM. F. WRIGHT, Late Acting Chief Eng'r, U. S. N.
JOHN S. ROAKE.
E. A. MAGEE, Engineer U. S. N.
E. M. HUGENTOBLER,
N. P. TOWNE, Engineer U. S. N.
} *Judges.*

**Statement of Tests.**

| | OTTO. | CLERK. |
|---|---|---|
| Diameter of cylinder | 8.5 inches. | 7 inches. |
| Stroke | 14 inches. | 12 inches. |
| Weight | 4,750 pounds. | 4,950 pounds. |
| Weight per brake horse power | 494.79 pounds. | 412.26 pounds. |
| Weight per indicated horse power | 433.39 pounds. | 365.68 pounds. |
| Floor space | 10 ft. x 4 ft. 6 in. Equal 45 sq. ft. | 9 ft. x 3 ft. 6 in. Equal 31.5 sq.ft. |
| Floor space per brake horse power | 4.68 sq. ft. | 2.62 sq. ft. |
| Floor space per indicated horse power | 4.10 sq. ft. | 2.33 sq. ft. |
| Net weight on brake | 111.34 pounds. | 146 pounds. |
| Average revolutions per minute | 155 | 147.1 |
| Length of lever in feet | 2.927 | 2.9427 |
| Cubic feet of gas used per hour | 236.55 | 293.65 |
| **Horse power by brake** | **9.6** | **12.007** |
| **Horse power by indicator** | **10.96** | **13.54** |
| Pressure of gas | 1¼ in. water. | 1 in. water. |
| **Cubic feet gas per brake H.P. per hour** | **24.64** | **24.44** |
| Cubic feet gas per indicated horse power per hour | 21.62 | 21.68 |
| Loss of explosions, full power | 6 per cent. | ⅛ of 1 per ct. |
| Temperature of cooling water | 58 degrees. | 58 degrees. |
| Temperature of outflow | 96 degrees. | 98 degrees. |
| Price | $1,075.00 | $1,050.00 |
| **Price per brake horse power** | **$111.98** | **$87.45** |

The Clerk Gas Engine Company respectfully commend the above report to the careful consideration of the Gas Fraternity—particularly as to the failure on the part of the challenging party to sustain their claim.

**The Clerk Gas Engine is Guaranteed for One Year from Sale.**

Circulars, prices, and full information furnished on application.

SOLE MAKERS,

## THE CLERK GAS ENGINE CO.,

WM. W. GOODWIN, President. E. STEIN, Secretary. S. LEWIS JONES, Asst. Secretary. A. B. STANNARD, Agent.

General Agents,

## THE GOODWIN GAS STOVE & METER CO.

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GAS STOVES. GAS STOVES. GAS STOVES.

# THE AMERICAN METER CO.,

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Nos. 244 & 246 North Wells Street, Chicago, Ill.

AGENCIES,

No. 177 Elm Street, Cincinnati, Ohio. Nos. 122 & 124 Sutter Street San Francisco Cal

No. 810 North Second Street, St. Louis, Mo.

**New Design Cast Iron "Economy" Cabinet Stoves.**—With Open or Closed Top

THE COMPANY MANUFACTURES

## GAS STOVES FOR COOKING AND HEATING PURPOSES,

**In all Sizes, for Domestic, Restaurant, and Hotel Use.**

Also,

## A Variety of Apparatus for Mechanical Purposes, Using Gas as Fuel.

These Stoves may be seen in operation at our Retail Store, No. 223 Sixth Avenue, N. Y. Call and examine.

SEND FOR ILLUSTRATED CATALOGUE SHOWING THE VARIOUS STYLES AND SIZES.

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**J. H. GAUTIER & CO..**

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GREENE AND ESSEX STREETS,

*JERSEY CITY, N. J.*

MANUFACTURERS OF

**Clay Gas Retorts,**

**Gas House Tiles,**

**Fire Bricks, Etc. Etc.**

Ground Clay, Fire Brick and Fire Sand in Barrels,

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**Clay Retort & Fire Brick Works,**

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**LACLEDE FIRE BRICK MFG. CO.,**

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Blast Furnace and Cupola Linings, every description of Fire Clay Material, Fire Clay Flue Linings, Chimney Tops Dry Milled and Crude Fire Clays, etc.

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ESTABLISHED IN 1845.

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OFFICE FOOT OF HOUSTON ST., E.R., N.Y.

**Gas Retorts,**

*TILES, FIRE BRICK.*

AND EVERYTHING IN THE FIRE CLAY LINE.

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FIRE BRICK & ENAMELLED CLAY

**RETORT WORKS.**

**ADAM WEBER.**

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Office and Works, 15th Street and Avenue C., N. Y.

Works, LOCKPORT STATION, PA.

—ESTABLISHED 1864.—

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**Fire Clay Goods for Gas Works.**

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OFFICE, 418 to 422 East 23d St., New York. ESTABLISHED 1856. WORKS, PERTH AMBOY, NEW JERSEY.

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We have studied and perfected three important points. Our retorts are made to stand changes of temperature, the strongest heats of the furnace, and the abrasion of feeding and emptying. Our customers are in almost every State of the Union, to all of whom we refer.

Thos. Smith, Prest. August Lambla, Vice-Prest. & Sup

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RETORT SETTINGS.

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**CHAS. TAYLOR,**

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Blast Furnace Linings, Cupola Blocks, Boiler Tiles, Grate Settings, and Stove Linings. Fire Cement, Fire Clay, Fire Sand, and all other Fire Clay Goods.

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**Formerly DIDIER,**

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The attention of all Gas Engineers is called to our Fire-Proof Material, viz.:

**CLAY GAS RETORTS**

(ENAMELED AND UNENAMELLED),

Blocks, Tiles

AND

**EXTRA FIRE BRICK,**

Pronounced by the highest authorities as superior to and excelling any other similar manufacture. The component of aluminum contained in our material (up to 45 per cent.) is larger than in any other material heretofore sold in the United States; whilst the uniformity of the goods is assured by the most scrupulous analysis of the clay used.

For any further information and prices please apply to

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**2 & 4 Stone St., Room 19, N.Y. City.**

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FOR

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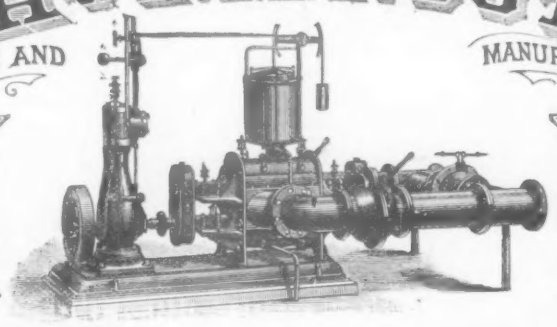

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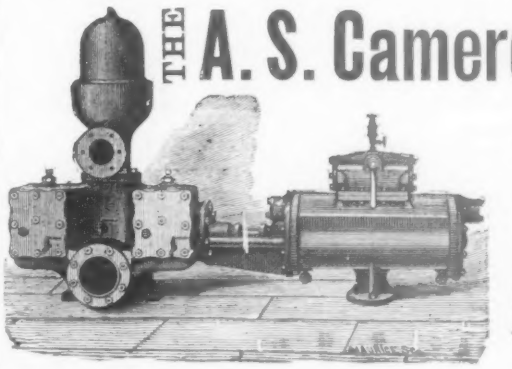

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Upward of 30,000 in Use.

**BEST GAS WORKS PUMP**

**Ever Introduced.**

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**Cast Iron Gas & Water Pipes, Stop Valves, Fire Hydrants, Gasholders, &c.**

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ALSO ALL SIZES OF

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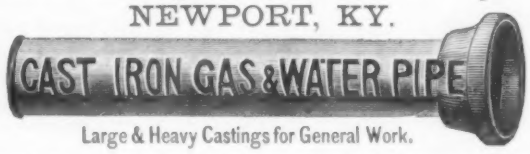
**Lamp Posts** AND **BENCH CASTINGS** A Specialty.

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Branch AND SPECIAL CASTINGS FOR GAS & WATER CO'S.

Manufacture Pipe from 2 to 48 inches. All work guaranteed first quality.

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## WROUGHT IRON PIPE,

VALVES AND GATES,

## Cast Iron Gas & Water Pipe.

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By C. J. R. HUMPHREYS. Price, $1.

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**Specials—Flange Pipe, Valves and Hydrants, Lamp Posts, Retorts, etc.**

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From 2 to 48 Inches in Diameter.

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## THE OHIO PIPE COMPANY,

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**BRANCH AND SPECIAL CASTINGS.**

Gas-House Bench Castings, Hydraulics, Lamp Posts, Flange Pipe and Specials, Architectural Castings, Building Columns, Joists, Cellar Grates, Sash Weights, etc.

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**SPECIAL CASTINGS & LAMP POSTS.**

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THE CHEMIST'S ASSISTANT; OR, KINDERGARTEN SYSTEM OF CHEMISTRY.

A system by which the elements and their valences are represented by illustrations and solid bodies.

BOX AND PAMPHLET COMPLETE, $2.50.

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Correspondence solicited.

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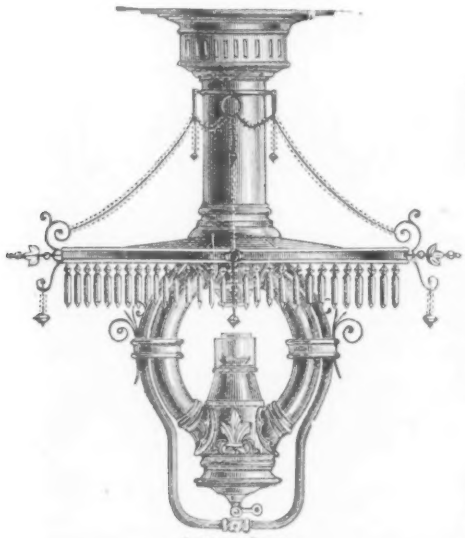

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## The Siemens and Lungren

# REGENERATIVE GAS LAMPS.

***A System of Burning Gas whereby its Illuminating Power is Increased fron 300 to 400 per ct. without the Expense, Trouble and Annoyance resulting frow the use of Hydrocarbon Enriching Material.***

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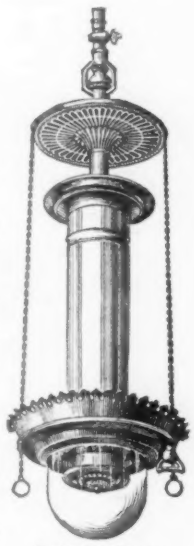

LUNGREN LAMP.

**THIRTEEN CANDLE POWER PER CUBIC FOOT OF GAS!**

This result is obtained

SIMPLY BY THE SCIENTIFIC APPLICATION OF THE REGENERATIVE PRINCIPLE.

Consequently this largely increased illumination is always maintained without further cost and frequent attention.

## THE SIEMENS-LUNGREN COMPANY,

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# THE "STANDARD" WASHER-SCRUBBER.

The "Standard" Washer-Scrubber has been adopted very generally by Gas Companies in North and South America, Europe, Asia, Australia, and New Zealand.

**NO OTHER APPARATUS REMOVES ALL THE AMMONIA FROM THE GAS.**

Its dimensions admit of placing it under cover without the great expense incurred in a high building to protect Tower Scrubbers from changes of temperature; thus the "Standard" Washer-Scrubber costs much less than other systems.

J. B. Crockett, Esq., President and Engineer of the San Francisco Gas Light Company, writes, under date of May 22, 1886:

"The 'Standard' Scrubbers have been in constant operation for the past six months, and have given entire satisfaction. We have tried them under many different conditions, and find that. by the use of about two gallons of water per thousand feet of gas, it gives us Liquor of 15 oz. strength. Our coal is from British Columbia, and contains large quantities of Ammonia, and we found it impossible to remove all the Ammonia with one gallon of water; but with two gallons we get good, strong Liquor, and at the same time have no traces of Ammonia at the outlet."

**Recent Orders for "Standard" Washer-Scrubbers have been received from**

J. P. HARBISON, ESQ., Treas. Hartford City Gas Light Company, and Prest. New England Association of Gas Engineers.
L. N. VAN KEUREN, ESQ., Secretary Bridgeport Gas Light Company - - - - - - - Bridgeport, Conn.
W. H. PEARSON, ESQ., Secretary and General Manager Consumers Gas Light Company, - - - - - Toronto, Can.
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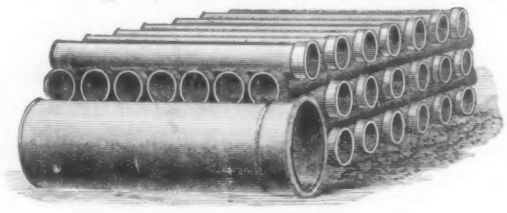
**Cast Iron Pipe, Fire Hydrants, Eddy Valves, Lamp Posts, Large Loam Castings, Flanged Pipe, Sugar House Work, Iron Roofs and Floors, Wrought & Cast Iron Tanks, Turbine Water Wheels and Pumps.**



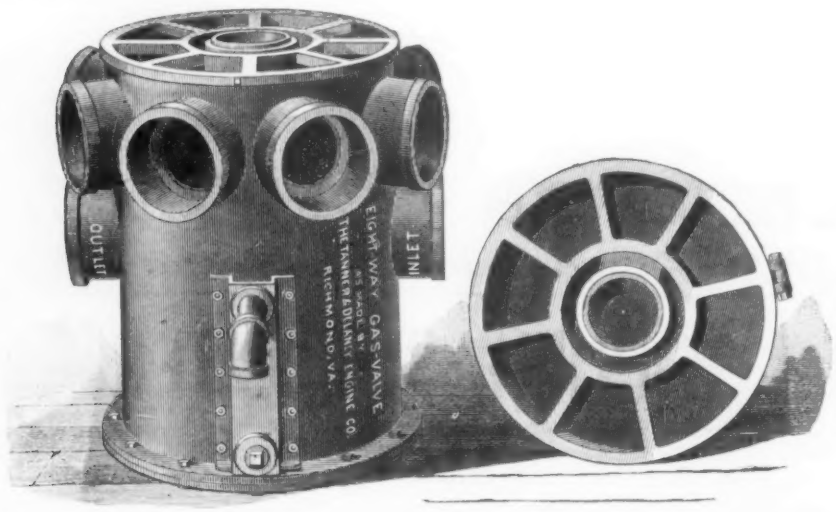
**Casholders, Lime Trays, Center Valves, Purifiers, Bench Work, Exhausters, Condensers, Governors, Scrubbers, Gas Valves Station Meters, Cast Iron Pipe Fittings.**

**Manufacturers of Heavy Castings and Machinery of Every Description.**

ENGINEERS & CONTRACTORS FOR THE ERECTION OF GAS WORKS, & ALL MACHINERY CONNECTED THEREWITH.

Estimates and specifications furnished for erection of new works or the extension or alteration of old ones.

**Foundries and Works. - - Millville, Florence, and Camden, N. J.**




W. E. TANNER, Pres. W. R. TRIGG, Vice-Pres. A. DELANEY, Sup

## Tanner & Delaney Engine Co.,

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## GAS APPARATUS,

INCLUDING

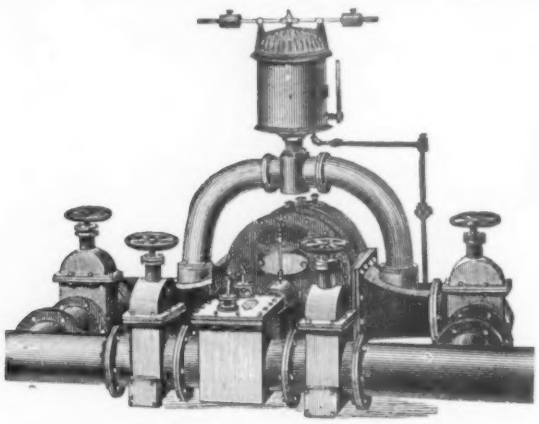
**Condensers of Various Styles**

SCRUBBERS, PURIFIERS, HOLDERS,

**Castings for Retort Houses, Etc.**

ALSO STEAM ENGINES AND BOILERS.

Plans, Specifications, and Estimates Furnished.



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## Machinery & Apparatus for Gas Works

**Drawings, Plans, and Estimates Furnished for the Improvement, Extension, or Alteration of Gas Works, or for the Construction of New Works.**

Mackenzie's Patent Rotary and Steam Jet Gas Exhausters, Governors, Compensators, Condensers, Washers, Scrubbers. Isbell's Patent Automatic Street Pressure Governor, Gas and Water Valves, Hydraulic Main Dip Regulator, Bench Castings, etc. Purifying Boxes and "Standard" Scrubbers. Isbell's Patent Self-Sealing Retort Doors.

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Successors to MERRICK & SONS,

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**Holders, Purifiers, Washers, Etc., Etc. Boiler and Tank Work. Steam Engines. Hydraulic Machinery. Bessemer Plants, Etc.**

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**ALL KINDS OF CASTINGS**
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**APPARATUS FOR GAS-WORKS.**

**BENCH CASTINGS**
from benches of one to six Retorts each.
**WASHERS: MULTITUBLAR AND AIR CONDENSERS; CONDENSERS; SCRUBBERS**
wet and dry), and
**EXHAUSTERS**
for relieving Retorts from pressure.
**BENDS and BRANCHES**
of all sizes and description.
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**MALLEABLE RETORT LID.**
PATENT
**SELF-SEALING RETORT LIDS.**
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**FURNACE DOOR AND FRAME.**
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GAS GOVERNORS,
and everything connected with well regulated Gas Works at low price, and in complete order.

SELLER'S CEMENT
for stopping leaks in Retorts.

N. B.—**STOP VALVES** from three to thirty inches—at very low prices.
Plans, Specifications, and Estimates furnished.

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**Single Lift and Telescopic**

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**Built, 1884:**

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|---|---|---|---|
| Altoona, Pa | Capacity, | 160,000 | cubic feet. |
| Pittsburgh, Pa. | " | 250,000 | " |
| " " | " | 220,000 | " |
| Bellaire, Ohio | " | 50,000 | " |
| Youngstown, Ohio | " | 60,000 | " |
| Canton, " | " | 60,000 | " |
| Akron, " | " | 80,000 | " |
| Xenia, " | " | 10,000 | " |
| Adrian, Mich | " | 65,000 | " |
| Ypsilanti, Mich | " | 25,000 | " |
| Muskegon, " | " | 70,000 | " |
| South Bend, Ind | " | 70,000 | " |
| Anderson, " | " | 20,000 | " |
| Plainfield, " | " | 10,000 | " |
| Springfield, Illinois | " | 100,000 | " |
| Evanston, " | " | 50,000 | " |
| Freeport, " | " | 35,000 | " |
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Plans and estimates furnished for the erection of new and the rebuilding of old works. Address

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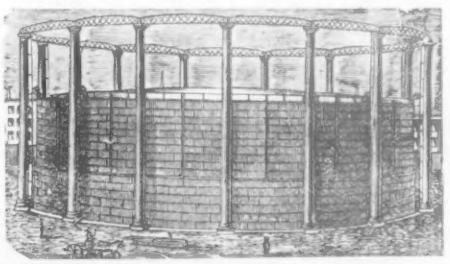

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ENGINEER AND MANUFACTURER OF
**GAS-HOLDERS.**
CONDENSERS, SCRUBBERS, VALVES, PURIFIERS, RETORTS, and HYDRAULIC MAINS,
and all other articles connected with the Manufacture and Distribution of Gas. Plans and Specifications prepared and Proposals given for the necessary Plant for Lighting Cities, Towns, Mansions, and Manufactories.

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## STACEY MFG. CO.,

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IRON ROOFS, BRIDGES, LAMP POSTS,

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And all kinds of Wrought and Cast Iron Work used in the erection of Coal and Oil Gas Works. Rolling Mill Machinery and Heavy Castings a Specialty.

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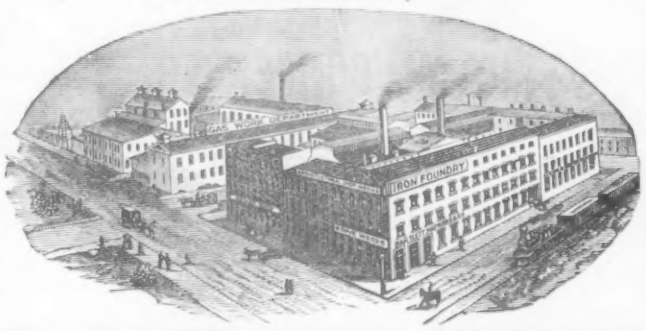
PURIFIERS. Roofs. Bench Castings.

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**Holders Built Since 1881:**

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| Fitchburgh, Mass. | Marlboro, Mass. | Glen Island, N. Y. | Portland, Oregon. | Macon, Ga. |
| New London, Conn. | Denver, Col. | Warren, Ohio. | Allegheny, Pa. (2d.) | York, Pa. |
| Derby, Conn. | Chicago, Ill. (West Side). | Bath, N. Y. | Atlanta, Ga. (2d.) | Chester, Pa. |
| Bridgeport, Conn. | Pittsburgh, Pa. (S. Side). | Lynn, Mass. | N.Y.City (Central Gas Co) | Hazleton, Pa. (2d.) |
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GAS COALS. EXHAUSTERS. GAS APPARATUS.

JAMES D. PERKINS. **PERKINS & CO.,** F. SEAVERNS.

General Sales Agents for

**The Youghiogheny River Coal Company's**

**OCEAN MINE YOUGHIOGHENY GAS COAL.**

The Coal from the Ocean Mine (recently operated by Messrs. W. L. Scott & Co., of Erie, Pa.,) is now used by all the leading Gas Companies in the United States from Maine to Texas, and is recognized as *the only reliable Youghiogheny Gas Coal.* (See Map on p. 87 of this Journal, Feb. 16, 1885.)

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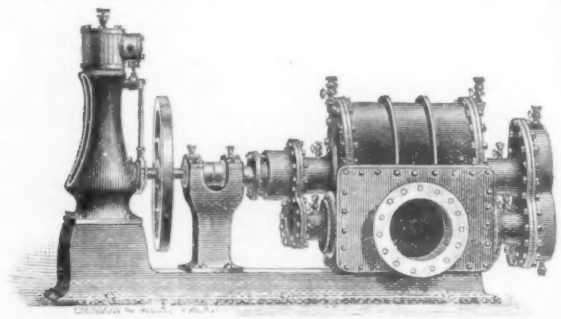

**The Wilbraham Gas Exhauster,**

"BAKER SYSTEM,"

WITH ENGINE ATTACHED, ON SAME BED PLATE OR WITHOUT.

**Best, Cheapest and Most Durable Exhauster known.**

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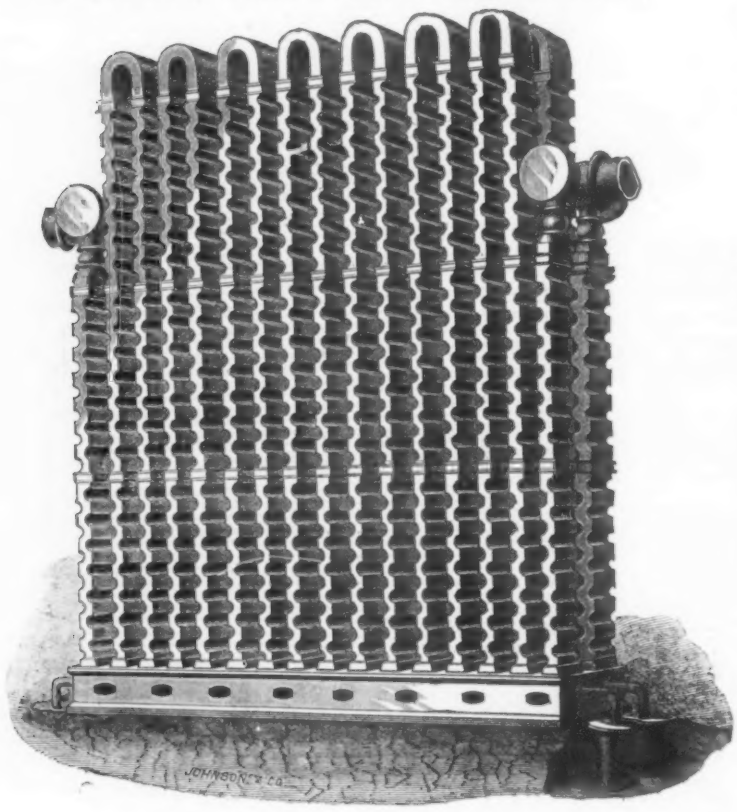
TRUSTEES AND AGENTS FOR THE

**SINUOUS FRICTION CONDENSER.**



We desire to draw the attention of the gas community to the merits of the SINUOUS FRICTION CONDENSER. Companies intending to introduce new condensers into their works will do well to confer with us and examine plans and estimates before contracting for any other pattern The FRICTION CONDENSER is now in use at the gas works located in the following places:

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| Portland, Me. | Brookline, Mass. | Pawtucket, R. I. | Fredericton, N. B. |
| Newport, R. I. | Chelsea, Mass. | Jamaica Plain, Mass. | St. John, N. B. |
| Gloucester, Mass. | Woburn, Mass. | Attleboro, Mass. | Paterson, N. J. |
| Newton & Watertown, Mass. | Peoria, Ill. | Calais, Me. | Dover, N. H. |
| | Clinton, Mass. | Fall River, Mass. | Waltham, Mass, |

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**GAS AND WATER MACHINERY**

OF THE MOST APPROVED PATTERN.

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STEAM ENGINES. GAS COALS. GAS COALS.

## Newburgh Orrel Coal Co.,

MINERS AND SHIPPERS OF

**Newburgh Orrel, Tyrconnell and Palatine Gas Coals.**

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**Mines Situated at**

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Shipping wharves at Locust Point. References furnished when required. Special attention given to chartering vessels.

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**DESPARD COAL**

To Gas Light Companies and Manufacturers of Fire Clay Goods Throughout the Country.

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Mines in Harrison Co., West Va. Wharves, Locust Point, Balt.

**Company's Office, 15 German St., Baltimore, Md.**

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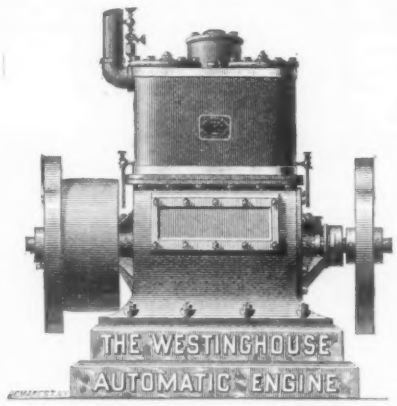


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**Our Sales Department** is conducted by **Skilled Engineers,** who will plan and contract for your entire plant at **ONE FIGURE AND ONE PROFIT.**

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THE

## PENN GAS COAL CO.

OFFER THEIR

**Coal, Carefully Screened & Prepared for Gas Purposes.**

Their Property is located in the Youghiogheny Coal Basin, near Irwin and Penn Stations on the Pennsylvania Railroad, and on the Youghiogheny River.

Principal Office:

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FOR THE SALE OF THE

**Superior Kanawha Gas Coals, Cannelton Cannel,**

**Also, SPLINT AND STEAM COALS.**

From the Kanawha and New River Regions, on the line of the Chesapeake & Ohio R'way.

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Chartered 1854.

**Mines situated on the Pennsylvania and the Baltimore and Ohio Railroads, in Westmoreland County, Penn.**

**POINTS OF SHIPMENT:**

PHILADELPHIA, BALTIMORE, SOUTH AMBOY, N. J.,
WATKINS (SENECA LAKE), N. Y.

Since the commencement of operations by this Company its well-known Coal has been largely used by the Gas Companies of New England and the Middle States, and its character is established as having no superior in gas-giving qualities, and in freedom from sulphur and other impurities.

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## MONONGAHELA AND PETERS CREEK GAS COAL CO.,

PRODUCERS OF

**Coal Bluff Gas Coal.**

MINES LOCATED ON THE MONONGAHELA DIVISION OF THE PENNSYLVANIA RR., IN THE CENTRAL PORTION OF THE PITTSBURGH COAL FIELD.

**Points of Shipment—Buffalo, Cleveland, Erie, Chicago, New Orleans.**

Since the introduction of Coal Bluff Gas Coal it has taken rank among the few first-class Gas Coals, and acknowledges no superior in gas-giving qualities, ease of working, quality of coke, and freedom from impurities.

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Western Agents, - - - F. R. BUELL & CO., - Milwaukee, Wis.

**General Office, 127 Fourth Ave., Pittsburgh, Pa.**

GAS METERS. GAS METERS. GAS METERS.

**INTERNATIONAL--1876--EXHIBITION.**

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**Twelfth and Brown Streets, Philadelphia, Pa. No. 49 Dey Street, N. Y. City, and No. 75 North Clinton Street, Chicago, Ill.,**

FOR THE FOLLOWING REASONS:

The Exhibit consists of a Series of METERS from the Largest Size Station Meters for the use of the MANUFACTURE OF GAS, to those for the use of the ORDINARY CONSUMER. The Instruments are WELL MADE, RELIABLE as to INDICATION, and embody a number of sundry improvements which, with the general character of the Exhibit, entitle the whole to commendation.

Attest—J. L. CAMPBELL, Secretary, pro-tem. Signed—A. T. GOSHORN, Director General J. R. HAWLEY, President

CHARLES E. DICKEY. JAMES B. SMALLWOOD. CHARLES H. DICKEY.

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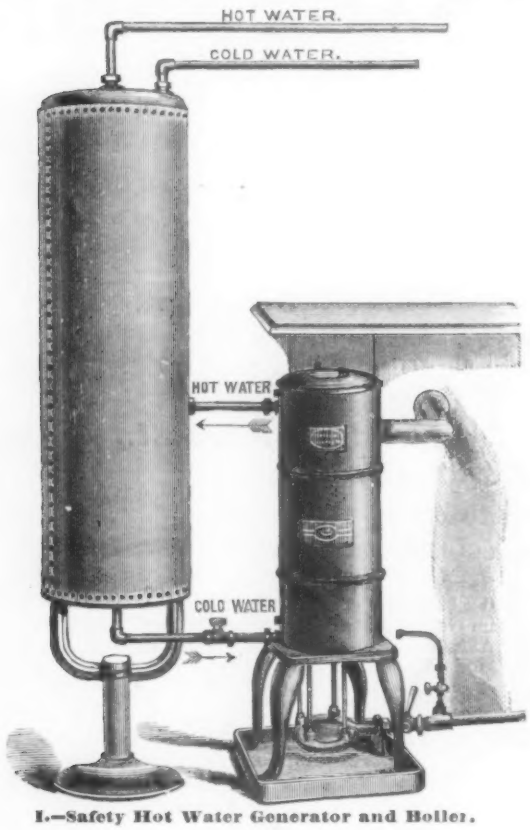


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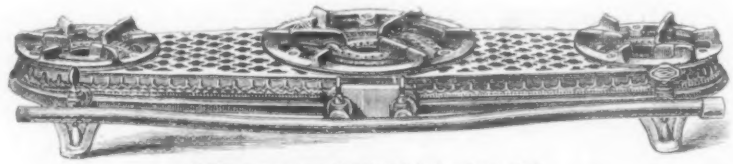

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